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REVIEW ARTICLES

(1) " **Antibacterial Agents derived from Micro-Organisms** ".

(2) " **The Present Position of Phenothiazine as an Anthelmintic** ".

(3) " **Trichomoniasis—A Review of Recent Literature** ".

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THE

VETERINARY BULLETIN

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DISEASES CAUSED BY BACTERIA AND FUNGI

*Butame, R. (1942). De streptococcenmastitis bij de runderen. I. Bacteriologische bewindingen. [**Streptococcal Mastitis of Cattle. I. Bacteriological Research**].—*Vlaam. Diergeneesk. Tijdschr.* **2.** 21–40 & 47–59. [Abst. from abst. in *Bull. Inst. Pasteur.* **41.** 15]. **945**

For two years B. made a systematic bacteriological study of different types of streptococci isolated from the bovine udder, *viz*, *Str. agalactiae*, *Str. dysgalactiae*, *Str. uberis*, and human and bovine strains of *Str. pyogenes*. He recommends crystal-violet blood agar for their isolation. Most types of *Str. agalactiae* gave a narrow zone β-haemolysis. Neither Van der Sheer's medium nor 10% serum beef broth proved to be specific, as streptococci of other groups gave an apparently positive reaction on these media. *Str. uberis* was easily identified. Human strains of *Str. pyogenes* were identified only by cultural reactions. Serological tests are proceeding.—H. I. Field.

Bryan, C. S. (1942). **Some Procedures that Affect the Bacteriological Quality of Goat Milk.**—*Dairy Goat J.* November. pp. 11. [Reprint only seen]. **946**

The incidence of mastitis in goats was determined in 27 herds comprising 619 animals, in the U.S.A. Ten (1·6%) had streptococcal mastitis, 5 (0·8%) staphylococcal mastitis, and ten had non-infectious mastitis as indicated by physical changes in the udder and milk, organisms being absent.

The importance is stressed of as strict rules of dairy hygiene in the production of goat's milk as of cow's milk.—D. D. Ogilvie.

Kearney, W., & Moloney, P. D. (1943). **Immunization as a Means of Overcoming Bovine Mastitis.**—*Vet. Rec.* **55.** 489–491. **947**

In a herd of 80 cows, 38 of which showed clinical mastitis (with an equal number of chronic and acute cases), bacteriological examination revealed streptococcal, staphylococcal, or mixed streptococcal-staphylococcal infections in 22 of 50 cows examined.

A mixed autogenous vaccine of staphylococcus toxoid and streptococcus anaculture was prepared and each animal received a first dose of 5 ml. followed after ten days by a dose of 10 ml. The authors record that they consider that allergic manifestations occurred in the form of a slight inflammation of the udder following this vaccination.

The herd received three courses of vaccination, one in July 1942, one in December 1942, and one in April of the following year. In November 1942, scrutiny of the herd revealed that 12% of cows clinically free prior to vaccination had developed mastitis after vaccination. The mastitis, however, was clinically less virulent than in the pre-vaccination cases. Of 19 animals with acute mastitis prior to vaccination, two remained slightly affected. After the second course of vaccination, further bacteriological examination of 55 samples revealed 45 of these to be free of infection. The position of the herd in August 1943 was that only four of 83 animals still harboured infection [no details of examination given]. After the December vaccination, one unvaccinated control heifer allowed to enter the herd developed acute mastitis of a virulent type two days after calving.

[No details of bacteriological examination of the whole herd at the various stages of the experiment are given nor information concerning the species of streptococci isolated from the herd or used in the vaccine. The species of *Streptococcus* isolated from the one uninoculated control animal when this animal developed mastitis is not stated.]—D. L. Robarts.

Jensen, G. W. (1943). **Field Observations in the Prevention and Control of Mastitis.**—*N. Amer. Vet.* **24.** 541–543. **948**

This is a short account of J.'s opinions concerning the non-bacterial predisposing factors in mastitis.

—D. L. Robarts.

de Villiers, S. W. (1943). **An Outbreak of Anthrax Amongst Koedoes.**—*J. S. Afr. vet. med. Ass.* **14.** 17–18. **949**

Investigation of mortality in kudus in the Karibib district of South West Africa showed that cases of anthrax were occurring. Smears taken from a dead kudu bull showed anthrax bacilli, but not many organisms were present. A smear from another kudu examined shortly after the first also showed anthrax bacilli. The deaths took place in mid-winter and apparently only bulls were affected. No cases occurred in any other species of domesticated animals in the area at that time. The author was unable to suggest how the animals became infected. He did not favour the theory that it was by the mouth, as kudus graze high, and he suggested the possibility of infection by bloodsucking insects such as the horsefly.—E. M. Robinson.

Stein, C. D. (1943). **Studies and Observations on the Laboratory Diagnosis of Anthrax.**—*Vet. Med.* **38.** 130–139. **950**

In some cases, *Bacillus anthracis* was recovered from contaminated material by treating 0·1 ml. of a saline suspension of the latter with 10 ml. of 1% or 2% phenol and allowing this to act for 60 min. at room temperature before seeding a few drops of the mixture directly on to plain agar.

Broth cultures of *B. mycoides* and *B. mesentericus*, mixed with broth cultures of virulent *B. anthracis* just before subcutaneous injection into g. pigs did not reduce the pathogenicity of the last organism, but *B. cereus*

and *B. subtilis* under the same conditions prolonged the death point for 2–3 days. Incubation of broth cultures of *B. anthracis* for 18 hours with soil organisms such as *B. mesentericus*, *B. flexus*, *B. megatherium*, *B. circulans*, *B. simplex*, *Corynebacterium pyogenes*, or *Erysipelothrix rhusiopathiae*, caused little or no inhibition of pathogenicity, but a mild inhibiting effect was shown by *B. cereus*, *B. subtilis*, pasteurella, streptococci, and staphylococci under similar conditions; *Pseudomonas aeruginosa* and *Bacterium coli* prolonged the death point for 2–5 days, *Ps. aeruginosa* in some cases affording complete inhibition.

Subcutaneous injection of 1 or 2 ml. doses of the following organisms failed to protect g. pigs against subsequent exposure to virulent cultures of *B. anthracis*, *B. cereus*, *B. siamensis*, *B. subtilis*, *B. mycoides*, *B. mesentericus*, avirulent *B. anthracis*, and a number of unidentified soil organisms.

B. anthracis was recovered by g. pig inoculation from the blood of a sick cow 48 hours before death. A strain of *B. anthracis*, with the cultural characteristics and virulence of a No. 2 Pasteur vaccine, was isolated from muscle swelling in a beef carcass at the site of vaccination [the animal presumably having been previously vaccinated against anthrax (orig. not clear)].

A culture of *B. anthracis* in serum broth, quickly frozen and held at a temperature of –5° to –10°C., was found after eight years to be both viable and virulent. —E. COTCHIN.

PULLINGER, E. J. (1942). **Incidence of Tubercular Mastitis in Dairy Cows.**—*J. S. Afr. vet. med. Ass.* **13.** 116–119. **951**

In the introduction to this article, it is mentioned that only two cases of TB. of bovine origin in human beings have been recorded in South Africa. As a result of his investigations in the municipality of Johannesburg, P. showed that infection of bulk milk samples with tubercle bacilli was about 2·5%, a comparatively low figure. Only 5% of milk samples from cows with diseased udders contained tubercle bacilli. It is suggested that in the high-veld areas of the Transvaal from which the bulk of Johannesburg's milk comes, cows which lose condition due to drought, cold, trek infections etc. are usually killed before TB. becomes very generalized in them and udder infection is therefore rarely found.—E. M. ROBINSON.

NANDA, P. N., & SINGH, G. (1943). **Tuberculosis amongst Goats at the Government Cattle Farm, Hissar.**—*Indian J. vet. Sci.* **13.** 70–74. **952**

A record of five cases of TB. encountered within a short period among goats at the Government cattle farm, Hissar. P.M. examination revealed lesions mainly in the lungs and associated glands. Bovine type tubercle bacilli were isolated, and it is presumed that infection was acquired from the cattle on the premises which were heavily infected with TB.—L. SAHAI.

CLAYSON, C. (1943). **Modern Trends in Preventive and Social Aspects of Tuberculosis.**—*Edinb. med. J.* **50.** 208–225. **953**

In Scotland, of a total of 1,300,000 cattle, about 50% show evidence of TB. Of 370,000 cows in milk, 0·5–1·0% have TB. of the udder and 8–10% of milk samples contain tubercle bacilli. In the human population, about 400 deaths per year are caused in Scotland by bovine type TB. and at any one time 3,000 persons suffer from TB. of bovine origin.

Preventive measures comprise pasteurization of the milk and increase in scope of the Attested Herds Scheme. It is advocated that all milk not pasteurized or from attested herds should be boiled.—D. D. O.

JENSEN, K. A., & JENSEN, K. E. (1942). **Occurrence of Tubercle Bacilli in Sewage and Experiments on Sterilization of Tubercle Bacilli-Containing Sewage with Chlorine.**—*Acta tuberc. scand.* **16.** 217–249. [In English]. **954**

Following a good review of early work on this subject, the authors describe their own investigations. Living, virulent tubercle bacilli were constantly demonstrated in the effluent even from the best constructed sewage plants of tuberculosis sanitoria. Sludge from one of these plants which must have been nearly a year old contained "rather a large amount of tubercle bacilli". The danger of infection associated with these conditions is discussed.

Laboratory experiments on sterilization of sewage with chlorine were carried out; it was shown that 9 mg. per litre was able in 1–2 hours to kill 100–100,000 tubercle bacilli per litre of sewage (sewage with a five-day biochemical oxygen demand of 28–43 mg. per litre).

Experiments carried out in practice showed that 10 mg. per litre chlorine were sufficient to kill the tubercle bacilli present in sewage when it had passed through an activated sludge plant that had reduced its content of organic substances expressed by the five-day biochemical oxygen demand of 11–63 mg. per litre. As the untreated sewage sludge from this purification plant still contained living virulent tubercle bacilli even after storage for a considerable length of time, it was considered highly objectionable to use this sludge as fertilizer before the tubercle bacilli had been killed by suitable treatment.—JOHN FRANCIS.

I. NAKHIMSON, L. I., & FANDERFLIT, E. P. (1942). Zhiznesposobnost' vaktsin BTsZh razlichnykh institutov. **[The Comparative Value of BCG Vaccines from Various Institutes].**—*Zh. Mikrobiol., Moscow.* No. 10. pp. 57–60. **955**

II. NAKHIMSON, L. I. (1942). K voprosu o sroke godnosti vaktsiny BTsZh. **[Contribution to the Study of the Value of BCG Vaccines].**—*Ibid.* pp. 60–64. **956**

I. Comparative testing of live BCG vaccines prepared by seven laboratories by resowing them upon Petragnani's medium showed the bacilli to be viable far beyond the official validity date. Vaccines prepared from cultures 12–16 days old were found to be the most active. The nutritional substrate appeared to have no influence on the viability of the bacilli.

II. Comparative studies were made on the antigenic properties of vaccines 5 and 33 days old, and no important differences were observed. In N.'s opinion vaccines up to 30 days old should be regarded as potent. Tests of potency are referred to.—A. MOLDAWSKY.

CORPER, H. J., & COHN, M. L. (1943). **Studies with the Vole (Meadow Mouse) Acid-Fast Bacillus. Virulence, Pathogenicity, and Specific Allergic Sensitizing and Immunizing Properties.**—*Amer. J. clin. Path.* **13.** 18–27. **957**

The findings of previous investigators on the cultural characters and pathogenic power for laboratory animals of the vole bacillus have been confirmed. It was noted, however, that g. pigs which tolerated fairly large doses of avirulent human and bovine (BCG) tubercle bacilli by the intravenous route, were sensitive to 1 mg. doses of the vole bacillus which produced death with widespread progressive lesions within 65 days. Infected g. pigs gave good intradermal reactions to various tuberculo-proteins, the hypersensitivity equalling that induced by equivalent amounts of avirulent human or bovine bacilli.

Immunity experiments suggested that the vole

bacillus and the avirulent mammalian strains, when inoculated in comparable doses, induced about an equal degree of resistance to a subsequent virulent infection. Since, however, the vole bacilli multiplied in the tissues and produced lesions which in some cases extended to the internal organs, the authors consider that this strain presents no advantages over avirulent mammalian bacilli for immunizing purposes.—R. E. GLOVER.

ALIKAEVA, A. P. (1940). Eksperimental'nyĭ paratuberkulez krolikov. [**Experimental Johne's Disease in Rabbits**].—*Veterinariya, Moscow.* No. 2. pp. 26–32. [French summary]. **958**

Groups of rabbits were infected intravenously and *per os* with 70-day-old *Mycobacterium johnei* grown on potato medium. To lower natural resistance, some of the rabbits were fasted or received injections of bovine bile. Typical lesions resulted in all groups of rabbits, characterized by multiple caseous abscesses in the region of the joints and pleura, contracted kidneys, and hypertrophy and hyperaemia of the parenchymatous organs. Gastro-intestinal lesions were rare. Cultures of the organism were obtained from the kidneys, liver, heart, and spleen of the rabbits.

The pronounced lesions did not appear until 12 months after the initial infection. A. considers that previous workers considered erroneously that rabbits are not susceptible to Johne's disease because they did not keep their rabbits under observation sufficiently long. —A. MOLDAWSKY.

THORP, F., Jr., LANGHAM, R. F., CLARK, C. F., & DOLL, E. R. (1943). **The Pathology of Bovine Pyelonephritis.**—*Amer. J. vet. Res.* **4.** 240–249. **959**

Six cases of bovine pyelonephritis are described, five in cows and one in a male calf. Studies were made on the biochemical and histological characters of the blood and urine. An increase in creatinine, uric acid, and non-protein nitrogen in the blood appeared in the terminal stages of the disease. The gross pathology and histopathology of the organs is described and well illustrated. *Corynebacterium renale* was isolated from five cases in many situations in the urinary tract and in the urine during life. In the case of the male calf, a diphtheroid organism is described which has not the characters of *Corynebact. renale.*—B. WEITZ.

GRAHAM, R., & LEVINE, N. D. (1943). **Studies on Listerellosis : V. A Note on the Use of Large Doses of Formalin-Killed Broth Cultures in the Experimental Prophylaxis of Ovine Encephalitis.**—*J. Amer. vet. med. Ass.* **102.** 365–367. [For previous parts, see *V. B.* **11.** 354]. **960**

In attempts to vaccinate sheep against ovine encephalitis, the authors made up four experimental groups. The first three groups were vaccinated subcutaneously with formalin-killed broth cultures, the dose being 20 ml. The first group received one inoculation, groups 2 and 3 were inoculated twice and three times respectively. The fourth group was a control group. The numbers of sheep in each group were adequate. Statistical analysis could demonstrate no significant protection in the first two groups, but three doses conferred a relatively weak immunity. Vaccination on these lines is not recommended.—D. L. HUGHES.

WEBB, R. A. (1943). *Listeria Monocytogenes* **Isolated from a Case of Infectious Mononucleosis.**—*Lancet.* **245.** 5–10. **961**

W. describes a human case of infectious mononucleosis from which was isolated an organism with all the characteristics of *Listerella monocytogenes.* Full details of all the tests used to identify the organism are given, as well as a discussion of the natural history of the disease in animals and the relation of *Listerella* to certain types of human meningitis and meningo-encephalitis and to infectious mononucleosis.

The following is a footnote to the article. "The generic name *Listerella,* proposed by Pirie (1927) was disallowed in September 1939, by the Third International Congress for Microbiology, meeting in New York City, on the ground that the name had already been used by Jahn in 1906 for a mycetozoan. It was therefore proposed (Pirie 1940) that the name *Listeria* be substituted ".—D. L. HUGHES.

BREED, F. (1943). **Erysipelothrix rhusiopathiae and Pasteurella avicida in Chickens.**—*Vet. Med.* **38.** 430–431. **962**

Heavy mortality (200 birds) occurred in a flock of 300 young birds approximately six months old. Older birds were not affected. *E. rhusiopathiae* and *Past. aviseptica* were both recovered from the tissues of dead birds. Deaths in the first place were very acute, but later the disease became more chronic, some birds living for nearly two weeks. Losses ceased after the adoption of treatment consisting of 2 ml. of erysipelas antiserum per bird, but no beneficial effect was noticed in birds already sick.—J. D. BLAXLAND.

SMITH, H. C. (1943). **Tularemia in a Dog.**—*N. Amer. Vet.* **24.** 420–422. **963**

A healthy five-year-old male Springer Spaniel used for hunting brought in a half-dead rabbit; three days afterwards the dog's face was greatly swollen and food was refused; the condition persisted, the lymph nodes being also swollen and the temperature was 106·4. A diagnosis was not made and no treatment being successful, the dog was destroyed after two weeks. At autopsy, the lymph nodes of the head and neck were found to be enlarged to four times the normal size, and the spleen was twice its normal size and contained many small abscesses. There was failure in attempts to grow the organism in culture from the lesions. Two g. pigs inoculated with material from the lesions died on the 8th and 12th days. Agglutination was obtained in a dilution of 1 : 800. The transmitting agent of the disease is the Rocky Mountain wood tick, *Dermacentor andersoni.*—A. C. JONAS.

KHATENEVER, L. M. (1942). Nekotorye itogi izucheniya tulyaremii za 25 let v Sovetskom Soyuze. [**Research on Tularaemia in the Soviet Union During the Last Twenty-Five Years**].—*Zh. Mikrobiol., Moscow.* No. 11/12. pp. 82–86. **964**

Tularaemia was confirmed in human beings in the U.S.S.R. in 1926. Grey rats, musk rats, water rats, and various species of mice and other rodents are regarded as natural reservoirs of infection. Among the secondary sources of infection, water and foodstuffs contaminated by infected animals and in which the causal bacteria may survive up to three months, may play an important role. It has also been confirmed that various blood-sucking insects and ticks may act as transmitters. The following species of ticks and insects were found as transmitters. Ticks :– *Dermacentor marginatus* and *Ixodes apronophorus* both from water rats, *D. pictus* [*? D. albipictus*], *D. silvarum, I. ricinus* and *I. persulcatus.* Fleas :– *Ceratophyllus walkeri* and *Ctenophthalmus pollex.* Flies :–*Chrysops relictus* and *Chrysozona pluvialis.* Mosquitoes :– *Aëdes cinereus* and *A. excrucians.*

Outbreaks of the disease in human beings are classified as mouse-borne, water-borne, alimentary, transmitted, and occupational infections.

Among the diagnostic methods, the rapid agglutination, rapid ring precipitation, and intradermal tularin tests were found to be satisfactory.

Clinically, tularaemia occurs in the U.S.S.R. in a bubonic form and in a generalized form. Satisfactory

results are claimed for the use of antiserum and vaccines.

Research is being carried out on the cultivation and viability of *Pasteurella tularensis*.—A. MOLDAWSKY.

BRUNER, D. W., & EDWARDS, P. R. (1942). **Micro-organisms of Group E of the Genus Salmonella.**—*Bull. Ky agric. Exp. Sta.* No. 434. pp. 12. **965**

In a study of the biochemical and serological properties of 320 group E (Kauffman-White classification) Salmonella cultures, 60% of which were isolated from fatal infections of fowls, 16·8% from pigs, and 21·2% from man, no one member showed sufficient differential characteristics on the basis of fermentation tests for the determination of a specific type, whereas a serological analysis demonstrated the existence of ten distinct types, four of which were new. The serological tests used to identify the ten types are given in tabular form and the zoological distribution and frequency of occurrence in the U.S.A. of the new members of the group are described in detail, together with the results of antigenic analysis. Three of the new serological types possessed diphasic flagellar antigens, while the fourth possessed hitherto undescribed flagellar antigens which were monophasic. A table showing the distribution and frequency of occurrence of the ten types in birds and mammals indicated that they were probably not host-specific and that eight of them occurred in pigs.—R. O. MUIR.

SCHWABACHER, H., TAYLOR, J., & WHITE, M. H. G. (1943). **Human Infection with Bact. cholerae-suis. A Report of Two Cases.**—*Brit. med. J.* Sept. 18th. 358–359. **966**

Fatal cases of generalized infection with *Salmonella cholerae-suis* in a woman, aged 40, and a butcher's boy, aged 18. The strains isolated had the antigenic formula : VI, VII : c : 1, 3, 4, 5, but showed a minor difference from classical strains by producing H_2S. The source of infection was not determined in these cases.—E. C.

BYRNE, J. L. (1943). **Variant or Atypical Strains of Salmonella Pullorum. A Serological Study.**—*Canad. J. comp. Med.* **7.** 227–238. **967**

The study was initiated as a result of the inability of the so-called " Conference " strains of *S. pullorum* widely employed in Canada and the U.S.A. as diagnostic antigens in the agglutination test, to pick out infected birds in certain flocks. Cross-agglutination tests with hyperimmune rabbit antisera prepared from ten strains of *S. pullorum*, including the Conference strains and variants isolated from non-reacting fowls, indicated no antigenic differences. On the other hand, in cross-agglutination absorption tests, a distinct antigenic difference was found between typical *S. pullorum*, as exemplified by the Conference strains, and the variants.

Following a discussion and pending further study, B. suggests methods for the control of the disease in flocks infected with the variant strain.—L. M. HEATH.

HINSHAW, W. R., BROWNE, A. S., & TAYLOR, T. J. (1943). **Fermentation of Maltose by *Salmonella pullorum*.**—*J. infect. Dis.* **72.** 197–201. **968**

Three hundred stock cultures of *S. pullorum*, the majority isolated from turkeys and chickens, were examined for ability to ferment maltose ; 40 did not produce gas from carbohydrate media ; 27 anaerogenic strains and 260 aerogenic strains fermented maltose. Strains which on primary isolation failed to ferment maltose did so after storage and subcultivation. This maltose-fermenting property did not remain a constant feature. From the maltose-fermenting stock cultures, non-maltose-fermenting variants could be obtained.

Details are given of maltose fermentation by numerous substrains obtained during several years from two stock strains which, on original isolation, had not this property, and from one stock strain which was considered to be a consistent maltose fermenter.

—J. E. LANCASTER.

POLDING, J. B. (1943). **Brucellosis in India.**—*Indian J. vet. Sci.* **13.** 27–34. **969**

In a survey of the incidence of brucellosis, it was found that *Br. abortus* and *Br. abortus-melitensis* were the species responsible for infection among bovine animals in India ; the incidence of *Br. melitensis* was negligible, even in goats. The indigenous strain appeared to be *abortus-melitensis* in type, as infection in village cows was exclusively of this kind. In organized dairy farms, *abortus* and *abortus-melitensis* occurred in equal proportions.

The extent of infection was proportional to the amount of European blood in the herd. There were twice as many cases among cross-bred stock as in country-bred cattle or buffaloes. From observations of the percentage of animals aborting once or more, it is deduced that the average expectation of calf loss per aborting animal was 1·24 for the cross-bred, 1·11 for the country bred, and 1·1 for the buffalo. Relatively more infected animals, particularly buffaloes, were found in areas with much rainfall and with a humid atmosphere.

On account of " inconstant reactors ", P. considers that tests at relatively long intervals, such as six months, will not indicate infected animals with sufficient accuracy to show which animals should be eliminated from the herd as a control measure. For such a purpose weekly tests would be necessary and would not, of course, be practicable. Stress is laid on the importance of hygiene for controlling the disease under Indian conditions, in preference to systems based on slaughter, disposal, or segregation.—V. R. RAJAGOAPALAN.

CAMERON, H. S. (1943). **Brucellosis in Swine. I. The Interpretation of Low Titer Reactions in Experimental and Field Infections.**—*Amer. J. vet. Res.* **4.** 169–172. **970**

Agglutination tests were performed on 327 pigs from herds which had experienced breeding difficulties. 131 reacted at 1 : 200, 84 at lower titres, and 112 were negative. 226 pigs from herds with no history of breeding difficulties gave negative results except for four animals recently added to one herd. Random samples obtained from an abattoir gave 86% negative results. Evidence that low-titre reactors do not remain constant was obtained from a group of pigs artificially infected.

—S. J. GILBERT.

CAMERON, H. S., GREGORY, P. W., & HUGHES, E. H. (1943). **Inherited Resistance to Brucellosis in Inbred Berkshire Swine.**—*Amer. J. vet. Res.* **4.** 387–389. **971**

Eighteen piglets from the matings of some inbred Berkshire pigs which probably possessed a natural resistance to brucellosis, were tested for resistance two weeks after weaning. They were given *per os* 5 ml. of a virulent suspension of *Br. suis*. None of the piglets developed blood agglutinins during the following 79 days. From this fact, the authors conclude that they were resistant to the infection. 34 grade pigs, the progeny of cross-bred sows, used as controls, showed varying results, 21 producing agglutinins and 13 not.

The authors suggest that a strain resistant to brucellosis might be established by inbreeding resistant Berkshire swine and probably also some other breeds.

—R. COOMBS.

HUDDLESON, I. F. (1942). **Immunity in Brucellosis.**—*Bact. Rev.* **6.** 111–142. **972**

H. reviews the whole field of immunity to brucellosis, quoting from numerous authors, and affirms that from the data now available a state of immunity to

brucellosis can be demonstrated in animals and man. In the bovine animal there appear to be two types of immunity, (1) a so-called "natural immunity" which functions in young animals up to or near the beginning of ovulation, and (2) an acquired immunity usually developing in unbred heifers and cows, and requiring for its stimulus the presence of live organisms in the body or the injection of a labile immunogenic constituent of the bacterial cell. In the light of present knowledge, it appears that the commonly known brucella serum antibodies are by-products arising from the reaction between antibodies and body tissues, and have no proved function in the active immunity mechanism. There is evidence to show that immunization with one species of brucella may afford protection against the other species.

Active immunity arising from infection and from vaccination are separately considered in the paper, both in the case of bovine animals and in human beings.

Br. melitensis infection in the goat requires further study.

No information is available in regard to active immunity occurring in swine as a result of *Br. suis* infection.

Published work on active immunity in laboratory animals, acquired by the use of vaccinal agents is also reviewed.—S. J. GILBERT.

MOHLER, J. R. (1943). **Results of Calfhood Vaccination against Brucellosis under Field Conditions.** pp. 2. Washington, D.C. : U.S. Dep. Agric. [4to]. **973**

A statistical account of the results of calfhood vaccination against brucellosis under field conditions from 1936–42. 21,005 calves were vaccinated and 17,737 remained in the 241 herds which continued to operate under the plan at the end of the period. The original herds showed 29·2% reactors and 8·4% suspicious reactors, so that the vaccinated calves were obviously exposed to infection. Normal calvings among the vaccinated animals numbered 17,056 (96·9%). Of these dams 3·9% were positive reactors and 9·5% suspicious after parturition. 552 (3·1%) of the vaccinated animals calved prematurely, and of these 27·4% were positive and 7·9% suspicious reactors. The total number of abortions among vaccinated cattle which could be attributed to brucellosis, *viz*, 195, represented 1·1% of the total calvings.—S. J. GILBERT.

GILYARD, A. T., & GILYARD, R. T. (1943). **Vaccinal Therapy in Fistulous Withers.**—*J. Amer. vet. med. Ass.* **102.** 204–207. **974**

Brucella infection has been repeatedly found associated with fistulous withers in horses. The histories are given of seven cases of fistulous withers which were treated with commercial brucella vaccine (strain 19). Six of these made permanent recoveries and one animal was destroyed before the final result of the treatment could be determined. The average period of time during which the horses were under treatment was approximately 3½ months, and the average number of injections given was three.—S. J. GILBERT.

LERENA, E. A. (1943). Mancha y gangrenas gaseosas, en los terneros. Diagnóstico diferencial en el campo argentino. A propósito de tres errores consecutivos de un laboratorio veterinario. **[Differential Diagnosis of Blackleg and Other Anaerobic Infections in Calves]**.—*Rev. zootéc.* **30.** No. 251. 27–29. **975**

L. reviews the differential diagnosis of blackleg and other anaerobic infections in calves, without contributing anything new. Blackleg in calves in the Argentine is always caused by *Clostridium chauvoei*. L. describes illness in calves which had been vaccinated with blackleg vaccine, and refers to mistakes which were made in the diagnosis of the cause.—MILLER WATSON.

BOSWORTH, T. J. (1943). **Some Aspects of Anaerobic Infections of Animals.**—*Vet. Rec.* **55.** 453–455. Discussion p. 455. **976**

B. discusses the natural distribution of the main pathogenic clostridia and the factors which render the host susceptible to their attack. Protective sera and vaccines are available but their use is restricted, because of economic considerations, to farms where losses are severe and regularly occurring. Formolized whole culture of *Cl. chauvoei* is the vaccine recommended for the prevention of blackleg. Lamb dysentery prophylactic is successful when of good quality and when correctly administered. Enterotoxaemia in Great Britain is irregular in incidence and morbidity. At present, antitoxin is the only prophylactic available for use where losses are expected. This disease is to be suspected where thriving lambs and fattening sheep die suddenly showing a pulpy condition of the kidney and other lesions of toxaemia.—J. KEPPIE.

ROBERTSON, M., & KEPPIE, J. (1943). **Gas Gangrene. Active Immunisation by Means of Concentrated Toxoids.**—*Lancet.* **245.** 311–314. **977**

Concentrated and partly purified toxoids of *Clostridium welchii* (Type A), *Cl. oedematiens*, and *Cl. septicum*, which had been prepared for the authors by biochemical methods, were used to immunize g. pigs. The efficacy of the individual toxoids was measured by infecting the animals with strains of the corresponding organism given in the form of intramuscular injections of washed bacilli or spores.

Two injections of toxoid spaced about three weeks apart were given and the value of a stimulating dose several weeks later was also tested. Very strong resistance to two strains of *Cl. oedematiens* was evoked with two or three spaced doses of *oedematiens* toxoid. This resistance persisted for at least five months. Satisfactory immunity was also produced by the similar use of *Cl. welchii* toxoid. The third or stimulating dose was especially valuable in this case in reviving the immunity which obviously decreased with the passage of time. The titre of circulating antitoxin was measured during the experiments and the degree of resistance to infection could be correlated with the level of the antitoxin in the blood. When a stimulating dose of toxin or toxoid was given to an already immunized animal, a lag period of a few days always occurred before the antitoxin response appeared. The use of *Cl. septicum* toxoid was also successful. Strong resistance could be produced, but many more Lf doses of the antigen had to be given.

It is concluded that in the case of all three organisms, a successful degree of immunity can be evoked which is dependent on sufficient antitoxin being present in the circulating blood.—J. KEPPIE.

GUILLAUMIE, M. (1941–42). Détermination du titre antitoxique des sérums anti-*perfringens* A, anti-Vibrion septique, anti-histolytique et anti-*oedematiens*. Préparation, titrage et propriétés des toxines correspondantes. (Premier mémoire). Contribution à l'étude de la toxine du Bac. *perfringens* A. (Deuxième mémoire). Contribution à l'étude de la toxine du *B. perfringens* A. Toxinogenèse dans différents milieux. (Troisième mémoire). Toxine et antitoxine du vibrion septique. (Quatrième mémoire). Etudes sur la toxine du *Bacillus histolyticus*. (Cinquième mémoire). Toxine et antitoxine du B. *oedematiens*. **[Determination of Antitoxic Titre of Antisera against *Clostridium welchii*, *Cl. septicum*, *Cl. histolyticum*, and *Cl. oedematiens*. Preparation, Titration, and Properties of Corresponding Toxins.**

I. Study of Toxin of *Cl. welchii* Type A. II. Toxinogenesis of *Cl. welchii* Type A in Different Media. III. Toxin and Antitoxin of *Cl. septicum*. IV. *Cl. histolyticum* Toxin. V. *Cl. oedematiens* Toxin and Antitoxin].—*Ann. Inst. Pasteur*. **66.** 204–247 & 329–378; **67.** 112–153 & 389–418; **68.** 202–225. **978**

I. *Cl. welchii* toxin can be prepared from a broth culture filtrate, by precipitation with ammonium sulphate. About 58% of the toxin present may be recovered in this way.

The results of titration of *Cl. welchii* antisera vary considerably with the samples of toxin used in the titration. Samples of toxin with comparable test dose values do not necessarily have the same antigenic constitution. Therefore, in the titration and comparison of *Cl. welchii* Type A antisera, identical samples of toxin complex (neurotoxin, haemolysin, necrotizing factor, etc.) should be used, or better still, monovalent toxins corresponding to the essential antigens of *Cl. welchii* toxin.

II. *Cl. welchii* Type A toxin, prepared in ordinary meat broth, is strongly haemolytic and has the ability to liquefy gelatin. The addition of cysteine to the broth in the proportion of 0·25–1·0% does not provoke any significant variation in the genesis of toxic or haemolytic factors, but when cysteine is added to a sample of toxin attenuated by storage, it restores the original haemolytic activity in some measure. The addition of buffer substances to the meat broth used for growing toxin accelerates its formation and increases the amount formed. Ascorbic acid has a similar effect in a very small degree. Synthetic media have not yet proved useful for toxin production.

Precipitated *Cl. welchii* Type A toxin, dried *in vacuo* and stored in ampoules at 2°C. loses its haemolytic power.

The haemolytic titre of a sample of toxin may vary with the serum employed in determining the titre.

The antihaemolytic titre of *Cl. welchii* Type A antiserum depends on the sample of toxin used in carrying out the titration. Sera with the same *in vivo* antitoxic power may have widely divergent antihaemolytic powers.

III. *Cl. septicum* toxin is prepared by growing the strain in 0·5% glucose broth, pH 7·6, at 37°C. Maximum toxicity is reached at 16–22 hours. The toxicity decreases by 25% or more during the following 18–24 hours if the culture is kept at 37°C. Ammonium sulphate precipitates about 64·8% of the toxin in the culture filtrate. In the dry state, precipitated toxin remains stable for several years and is highly antigenic.

The addition of dipotassium phosphate or sodium pyruvate to the glucose broth often increases toxin production, but ascorbic acid and dried horse blood have no such effect. The addition of dried blood, peptone, and meat extract to peptic digest of horse liver augments toxin production.

Titrations of toxin carried out with Standard International Serum and Standard French Serum furnish comparable results.

The antitoxic titre of a given serum estimated with different toxins may give results varying by more than 10–25%.

IV. Cultures of *Cl. histolyticum* grown at 37°C. in beef or horse-meat broth (pH 7·5–7·6) become highly toxic in 22 hours. The addition of dipotassium phosphate and sodium pyruvate to the medium may augment production, but peptone and dried horse blood have no such effect.

Ammonium sulphate precipitates 37–90% of the toxin present in the broth filtrate. Precipitated toxin has as great an antigenic power as crude toxin.

The *in vitro* haemolytic titre of a sample of toxin can be correlated with the lethal effect in mice.

Titrations of toxin with Standard International Serum correspond exactly to those carried out with Standard French Serum.

The antitoxic titre of an anti-*histolyticum* serum is not absolutely independent of the sample of toxin used in the titration. Results may vary by 16%.

V. *Cl. oedematiens* toxin grows well in beef or horse-flesh broth. Its formation is not favoured by the addition of liver or horse blood. Ammonium sulphate precipitates about 56·7% of the toxin present in broth filtrate.

The determination of the test dose of *Cl. oedematiens* toxin can be carried out just as well by subcutaneous injection of mice as by intravenous injection.

Titrations of a particular *oedematiens* antiserum with different samples of toxin may vary by 10–30%.

From the foregoing results, the antisera examined can be ranged in order of increasing precision of titration thus—*Cl. welchii, Cl. oedematiens, Cl. septicum*, and *Cl. histolyticum* antisera.—I. W. Brocklehurst.

Anan'eva, B. V. (1942). Titrovanie syvorotki antiperfringens metodom Neglera. **[Titration of *Clostridium welchii* Antiserum by Nagler's Method].**—*Zh. Mikrobiol., Moscow*. No. 10. pp. 79–84. **979**

Seventy-five different samples of *Cl. welchii* antiserum were titrated by Nagler's method [see *V. B.* **11.** 174.]; 66 of these were also titrated *in vivo* on mice and g. pigs. No important differences were observed between two methods. A. considers that Nagler's method is simple and economical and is satisfactory for recording the progress of immunization of serum-producing horses.—A. Moldawsky.

Stewart, S. E. (1943). **The Mechanism of Antitoxic Immunity in *Clostridium perfringens* (welchii) Infections in Guinea Pigs.**—*Publ. Hlth Rep., Wash.* **58.** 1277–1280. **980**

The phagocytosis of *Cl. welchii* infection in g. pigs was studied. An invasive strain was injected intraperitoneally and stained films of the peritoneal fluid were examined. A contrast was shown between control animals and those which had circulating antitoxin derived from active or passive immunization. In the former, a massive, fatal infection developed. Phagocytosis was very marked in the immunized animals and within 20 hours very few bacteria remained. When leucopenia was induced by pre-treatment with benzene, the circulating antitoxin was unable to arrest the fatal invasion because of the absence of phagocytosis.—J. K.

Tager, M., & Liebow, A. A. (1942). **Intranasal and Intraperitoneal Infection of the Mouse with *Coccidioides immitis*.**—*Yale J. Biol. Med.* **15.** 41–59. **981**

With the recognition of San Joaquin Valley fever as the primary form of coccidioidomycosis, the experimental production of pulmonary infection with *C. immitis* has become important. Human beings usually recover from the acute stage of the infection, and, as a result, less is known of the early changes than of the well established reaction of the chronic coccidioidal granuloma.

After intranasal inoculation of mice, pulmonary infection with little or no generalization occurred. Intraperitoneal inoculation caused generalized infection, with special involvement of the abdominal lymph nodes and, again, the diaphragm and the lungs, but when the same dose was given by this route as was given intranasally a lower acute mortality was produced. The polymorphonuclear leucocytes were the chief cells concerned in the acute reaction to *C. immitis*, followed by abscess formation. With greater chronicity, organizing abscesses,

granulomas, and caseating necrosis were encountered. In the most chronic group studied (75–80 days), the entire process was that of an advanced stage of healing, with a very marked diminution in the number of spherules present in the tissues. Amyloidosis was noteworthy as a complication of chronic coccidioidomycosis. —JOHN FRANCIS.

CLEVELAND, D. E. H. (1943). **Infectivity of Fluorescent Hairs in Scalp Ringworm.**—*Canad. Med. Ass. J.* **49.** 280–282. **982**

Children, although clinically cured, may have hairs which fluoresce characteristically under ultra-violet light passed through a filter of Wood's glass ; such hairs produced growths on Sabouraud's medium and a typical infection when inoculated on to a kitten. C. considers his investigation complementary to that of DAVIDSON and co-workers (1934) who found that kittens with no symptoms of infection, but whose hairs showed fluorescence should be considered to be infective. —A. C. JONAS.

ROBERTS, J. L., & BALDWIN, I. L. (1942). **Spore Formation by *Bacillus subtilis* in Peptone Solutions Altered by Treatment with Activated Charcoal.**—*J. Bact.* **44.** 653–659. **983**

The sporulation of *B. subtilis* in varying concentrations of different brands of peptone was studied to ascertain the nature of its response to treatment with activated charcoal and other adsorbents. The percentage sporulation proved to be independent of the peptone concentration in the treated solution and a greater percentage of cells sporulated in charcoal-treated than in untreated peptone solutions. These results suggested that the sporulation of *B. subtilis* in peptone solutions was inversely proportional either to the concentration of some particular food factor or factors or to a factor which inhibited spore formation. Charcoal treatment improved the percentage sporulation in Bacto and Parke-Davis peptones, but not in Witte and proteose peptones. Adsorption of the peptone solution with kaolin, ferric hydroxide, or aluminium hydroxide also increased the percentage of sporulating cells. Charcoal was found to exert its optimum spore-propagating effect in the pH range of 3 to 5. The addition of 0·1% agar to charcoal-treated and untreated peptone solutions raised the percentage of sporulation in both cases, but its effect differed from that of charcoal in that it could not overcome the deterrent effect of high peptone concentrations.—R. O. MUIR.

MUDD, S., HEINMETS, F., & ANDERSON, T. F. (1943). **Bacterial Morphology as Shown by the Electron Microscope. VI. Capsule, Cell-Wall and Inner Protoplasm of Pneumococcus, Type III.**—*J. Bact.* **46.** 205–211. [For previous parts, see *V. B.* **14.** 143]. **984**

The pneumococcal capsule was demonstrated as a gel of low density surrounding the cell wall. The cell wall is distinct from the inner bacterial protoplasm which is surrounded by its own protoplasmic membrane.—JOHN FRANCIS.

KATZIN, L. I., & SANDHOLZER, L. A. (1943). **Bacterial Death Rates and Decimal Reduction Time.**—*J. Bact.* **45.** 19–20. [Only abst. given : copied *verbatim*]. **985**

It is now well established that bacterial death rates under numerous conditions approximate the monomolecular reaction rate. The awkwardness of the reaction rate constant has hindered its acceptance in measuring bacterial resistance. The concept of "Decimal Reduction Time" (*DRT*) is here proposed for everyday usage. This is analogous to the radioactive "half-life" but refers to 10 per cent survival rather than 50 per cent survival, which is of greater practical interest to the bacteriologist. The *DRT* is defined by the following equation :

$$DRT = \frac{2{\cdot}3}{k} = (t_2 - t_1)/\log_{10}(C_1/C_2)$$

This is derived from the monomolecular rate equation. C_1 and C_2 are the initial and final concentrations of organisms, respectively, corresponding to times t_1 and t_2 ; k is the reaction rate constant. A strain of organisms with a *DRT* of 2 minutes in 0·5 per cent saline at 58°C. is reduced, under those conditions, from 1,000,000 to 100,000 cells per milliliter in 2 minutes treatment, 10,000 in 4 minutes, 1,000 in 6 minutes, and so forth. Test medium, strain of organisms, physiological age of culture, and temperature of treatment must be specified and kept constant.

Standard 24-hour cultures of 66 strains of *Escherichia* were heated in whole milk at 61°C. for measured intervals. Counts were made before and after treatment. Rough and smooth variants of the same strain gave similar *DRT* values. Successive trials on the same strain and trials for different time intervals gave good checks. The *DRT* for most of the strains was less than 0·5 minute, and for none was as high as 2 minutes.

KATZIN, L. I., SANDHOLZER, L. A., & STRONG, M. E. (1943). **Application of the Decimal Reduction Time Principle to a Study of the Resistance of Coliform Bacteria to Pasteurization.**—*J. Bact.* **45.** 265–272. **986**

The application of the principle of decimal reduction time (DRT) [see preceding abst.], is illustrated by a study of 66 strains of *Escherichia* in milk. It is shown that under ordinary circumstances of pasteurization at 142°F., few, if any, coliform organisms survive. In the strains under examination, none of the DRT's exceeded 2 min. The use of DRT's offers a means of determining the margins of safety in pasteurization. An overall figure cannot be given since the DRT for the tubercle bacillus is not yet available. A list of DRT's for various temperatures of a number of other organisms is, however, appended.—D. D. OGILVIE.

See also abstr. **1116** (staphylococcal infection), **1118** (mastitis), **1017-1020, 1022, 1120** (TB.), **1158-1160** (TB. diagnosis), **1021** (Johne's disease), **1057** (Pasteurella in goats), **1027, 1150** (salmonella), **1121** (gas gangrene organisms).

DISEASES CAUSED BY PROTOZOAN PARASITES

JOYEUX, C., & SAUTET, J. (1941). Sur quelques détails morphologiques d'une souche syrienne de Trypanosoma evansi (Steel, 1885). [**The Morphology of a Syrian Strain of *T. evansi***].—*Arch. Inst. Pasteur Algér.* **19.** 222–227. **987**

The isolation is recorded from Syria of a trypanosome showing a polymorphism similar to that of *T. brucei*. The organism was found in smears taken from a camel at Deir Ez Zor near the Euphrates, and showed ablepharoplastic forms, and also short forms with no flagellum (1 per 500), and forms with rudimentary flagella (5%).—U. F. RICHARDSON.

JANSEN, G. (1941). Contribuição ao estudo do mal de cadeiras na Ilha de Marajó. [*Trypanosoma equinum* **Infection in Marajo Island, Amazon Delta, Brazil**]. —*Mem. Inst. Osw. Cruz.* **36.** 347–362. **988**

T. equinum infection still exists in Marajó, in an enzootic form, in spite of the fact that the capybara, *Hydrochoerus hydrochoerus*, believed by LUTZ to be the reservoir host, has now almost entirely disappeared from the island. It appears that apparently healthy horses can carry the infection from one season to another. Such latent infections can be diagnosed by animal inoculation.

J. found that trypanosomes in the digestive tubes of *Stomoxys* and Tabanids became rounded and immobile, and lost their virulence for white mice after about eight hours.

The saliva of an artificially infected bat proved uninfective for the dog.—ISOBEL W. BURTON.

TALIAFERRO, W. H., & OLSEN, Y. P. (1943). **The Protective Action of Normal Sheep Serum against Infections of *Trypanosoma duttoni* in Mice.**—*J. infect. Dis.* **72.** 213–221. **989**

Mice were infected by the intravenous inoculation of *T. duttoni*, and were immediately given intraperitoneal injections of normal sheep serum. Intravenous injection of the trypanosomes was adopted as it was found that trypanosomes appeared regularly in 4–8 days in the blood of controls so infected, whilst after subcutaneous injection, appearance varied over the wide range of 4–25 days.

The protective property was generally demonstrable in the serum of sheep more than a year old, in doses of 0·5 ml. or more per 20 g. mouse. It might give complete protection in all doses above the minimum or might show zones of inhibition, *i.e.*, protection alternating with partial or no protection. It was not diminished in titre after severe injury of the liver. It was absent or weak in the foetus and newborn lamb, and apparently did not pass through the placenta.

The possibility is discussed that the protective property may be due to an antibody arising as a result of infection with *T. melophagium*.—U. F. RICHARDSON.

MORGAN, B. B. (1943). **A New Record on the Isolation of *Trichomonas foetus* (Protozoa) in Pure Culture.**—*Cornell Vet.* **33.** 310–312. **990**

An aborted foetus of 138 days' gestation, in almost intact foetal membranes, was examined about 90 min. after abortion. The amniotic fluid contained about 2,080,000 trichomonads per ml. and the allantoic fluid about 1,120,000 per ml. The pH of the fluids was 6·8 and 6·7 respectively. Ten tubes of modified Schneider's medium were inoculated with amniotic fluid and ten similar tubes with allantoic fluid. These were incubated at 37°C. for four days, at the end of which time the trichomonads had reached their maximum growth. Three tubes were grossly contaminated with *Bacillus subtilis*, but the remainder contained good growths of trichomonads. Subcultures made every ten days yielded abundant growths apparently free from bacteria. The maximum concentration of trichomonads was about four millions per ml., and was obtained after four days' incubation at 37°C.

A second strain was isolated by the same method from a foetus of 48 days' gestation. The concentration of trichomonads in the amniotic and allantoic fluids was in this case 3,200,000 and 1,280,000 per ml. respectively and the pH of the fluids was 7·2 and 7·1 respectively.
—J. G. MURRAY.

I. ZAIN, H. (1941). Zum Ursprung der Endothelstadien des *Plasmodium gallinaceum*. [**On the Origin of the Endothelial Stages of *P. gallinaceum***].—*Arch. exp. Path. Pharmak.* **197.** 210–223. [Shorter version appeared in *Klin. Wschr.* **20.** 176–177. (1941).] **991**

II. ZAIN, H. (1941). Verhalten der aus erythrocytären Parasitenformen hervorgegangenen E-Stadien des Plasmodium gallinaceum. [**Behaviour of Endothelial Forms of *P. gallinaceum* Originating from Erythrocytic Forms**].—*Arch. exp. Path. Pharmak.* **198.** 551–556. **992**

I. Together with the malaria parasites which develop in the erythrocytes, there exist forms in the endothelial-cell elements of the host which can be described as endothelial stages (E-stages) or also as exo-erythrocytic forms (EE-stages). Mosquito-inoculated sporozoites have to change into E-stages before they can attack the erythrocytes. It is suspected that E-stages can also develop from erythrocytic forms. In the present paper the origin of E-stages from erythrocytic forms in *P. gallinaceum* is investigated. Attempts have so far failed to develop E-stages in tissue cultures of embryonic fowl spleen through the addition of malarious blood. *P. gallinaceum* was maintained by transinoculation from fowl to fowl, the blood for transinoculation being taken during the first acute attack when plenty of parasites were present. No EE-forms were found before the 21st day after the birds had been inoculated intramuscularly with malarious blood. The EE-infection only appears when the acute blood infection dies down. Season, breed, and age (from two months to over one year) do not influence the time of EE-infection. Intravenous transmission of numerous parasites reduced the period of latency and the blood phase reached its climax within a few days. The EE-infection made its first appearance on the 13th day after intravenous inoculation. If the EE-infections following intramuscular inoculation were compared with those following intravenous infection, the period between the EE-infection and the acute blood infection was the same in both cases. Plasma from blood rich in parasites proved to be infective. The course of blood infection after plasma inoculation corresponded to the infection produced after intramuscular inoculation with malarious blood. Z. has shown that it is not merozoites which transmit malaria in the plasma and no E-stages could be found there, but there occurred mature schizonts just on the point of sporulation. In three out of ten cases a premature appearance of EE-stages was observed after plasma inoculation and it was concluded that E-stages developed from phagocytosed mature schizonts. Parasites which had ended their development in the erythrocytes, if phagocytosed, changed into EE-forms but immature stages still developed into erythrocytic forms. At the same time, a considerably earlier appearance of EE-infections might be observed simultaneously with acute blood infection which is usually met with after transmission of malaria through sporozoites, and in every third case, approximately, after inoculation with malarious blood. The cause of the premature EE-infection was found to lie in the transinoculated E-stages. If the inoculated blood contained no E-stages, then the EE-infection developed from blood parasites and usually appeared only after acute blood infection.

II. E-stages of *P. gallinaceum* after transinoculation continue to develop in the new host and can lead to an EE premature infection which, in its course and morphology, cannot be distinguished from E-stage infection of the brain produced by sporozoite inoculation. Blood and brain served as an inoculum containing E-stages. E-stages are not regularly observed in the blood at the time of the E-stage infection of the brain.
—C. HORTON SMITH.

See also absts. **1122-1126** (trypanosomiasis), **1161** (cultivation of *Histomonas*), **1127** (ovine coccidiosis), **1128** (anaplasmosis), **1129, 1130** (piroplasmosis).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

FRIEDEWALD, W. F., & ANDERSON, R. S. (1943). **The Effects of Roentgen Rays on Cell-Virus Associations. Findings with Virus-Induced Rabbit Papillomas and Fibromas.**—*J. exp. Med.* **78.** 285–304. **993**

Rabbits affected with Shope's papilloma were subjected to X-ray irradiation. Small amounts of virus were detected by the application of serial dilutions of cell extracts to the skin of rabbits rendered hyperplastic with turpentine and acetone. After exposures to 5,000 r. of X-ray irradiation, the cells regressed completely: virus nevertheless persisted in practically undiminished amounts during the process and in the early stages often exceeded that found in the controls. Marked variations were noted however, probably dependent upon the strain of virus used, the amount of irradiation, and the idiosyncrasies of individual rabbits.

With regard to the fibroma virus it was found, both *in vitro* and *in vivo*, that inactivation was induced by far less irradiation than was required for papillomas.

It is suggested that X-rays cause a temporary change in the virus-cell relationship which facilitates the passage of the virus from the cell. No variants of either virus were encountered as a result of irradiation.

—R. E. GLOVER.

*ELLSSEL, F. W. (1941). Die Ursachen der Todesfälle und Notschlachtungen beim Rindvieh im Verlauf des MKS.-Seuchenganges 1938–1939 im Landkreis Hannover. **[The Causes of Death and Reasons for Slaughter of Cattle during the Foot and Mouth Disease Epidemic of 1938-39 in Hanover].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 492]. **994**

Fifty-five autopsies were performed on animals which had died, and 160 on animals slaughtered *in extremis*; of the former, 40 (71·4%) had lesions in the heart-muscle (30 acute parenchymatous myocarditis, and 10 "tiger-heart"), 8 (14·3%) in the stomach and intestine, 5 (9·1%) in the feet, and 2 (3·6%) on the udder. Of the latter, 95 (59·4%) had lesions on the feet of varying severity, 27 (16·9%) on the heart-muscle (21 acute parenchymatous myocarditis and 6 "tiger-heart"), 25 (15%) had lesions of the udder (22 being "*pyogenese*" mastitis, and 3 catarrhal inflammation of the udder), and 13 (8·1%) had lesions of the stomach and intestines.—JOHN FRANCIS.

O'BRIEN, T. F. (1943). **Notes on the Behaviour of the Foot-and-Mouth Virus during the 1941 Epizootic in Eire.**—*Vet. Rec.* **55.** 341–342. Discussion p. 343. **995**

The author gave a general description of the symptoms in the various domestic animals and discussed the problem of differential diagnosis and the special difficulties met with in the outbreak under discussion.

Opening the discussion, J. D. WHITTY said that the epidemic broke out on 20th January, 1941, in County Donegal and spread to 14 counties, the last outbreak being confirmed in Carlow on 22nd September, and 27,942 cattle, 10,187 sheep, 3,310 swine, and 608 goats were slaughtered, compensation for slaughtered animals amounting to £451,021.

The disease was more severe in milch cows and fat cattle than in stores, although some of the latter were severely affected. Sheep were only affected in four outbreaks, although very often exposed to infection. In many of the outbreaks swine were exposed to infection but did not develop the disease. Goats were not affected, although often in close contact with affected animals. A striking contrast was noticed in the effect of feeding infected skim milk to young calves and young pigs. The former often died suddenly, while the latter did not die but appeared normal except for vesicles on their feet. Calves, about 6–8 weeks old, died suddenly with no lesions. Older calves and adult cattle would later show symptoms of the disease, having become infected from the animals fed on the contaminated milk. The young calves often showed atypical lesions consisting of shallow circular ulcers, about ¼ inch in diameter, situated on both sides of the hard palate almost opposite the corner incisors. There were no tongue or foot lesions. In older calves there were mouth lesions but no lameness, illustrating how such cases could be overlooked without a careful examination of the mouths. In-contact young calves not fed on infected milk appeared to have a strong resistance to infection. Experiments were made to find the most efficient method of killing the virus in the skim milk at the creameries, and it was found that by taking a T from the steam pipe directly into the skim-milk delivery tank, it was possible to raise the temperature to 190°F. which was done for not less than 1 min. This procedure was made compulsory in the creameries in scheduled districts and in a wide surrounding area, together with an elaborate system of disinfection of premises, horses, vehicles, churns, and personnel. Following the compliance with these safeguards, no further cases originated through the creameries. The creameries which had dealt with contaminated milk were shut down until they had been thoroughly disinfected.

J. J. CAMPBELL described how he was able to observe animals in various stages of the disease and later perform P.M. examinations on a number of them. It was found that typical vesicles, mostly ruptured, were very common in the oesophageal groove of the rumen of the cattle. The rumen was congested when the vesicles were unbroken or recently ruptured. Rumenal vesicles were more common when the disease was virulent and spread quickly. In one case, unruptured rumenal vesicles were the only lesions found. It was not uncommon to see cattle with a high temperature, salivating profusely, and "smacking" for 48 hours before lesions appeared. A large number of animals had teat vesicles only. It was remarkable to note that many cattle would commence feeding a few hours after the tongue had been stripped of epithelium, and also that many pigs in contact with affected cattle did not show any symptoms of the disease before or after slaughter.

M. J. MACCLANCY drew attention to the high degree of infectivity before diagnostic symptoms were shown. In his experience vesicular stomatitis is rarely seen at the ports but non-vesicular conditions due to actinobacillosis and actinomycosis are common.—J. FRANCIS.

MANGRULKAR, M. Y. (1939). **The Menace of Rabid Dogs in India.**—*Agric. Live-Stk India.* **9.** 695–706. **996**

This article contains no new information. An appeal to Government is made to enforce the following measures for control of rabies:—(1) destruction of ownerless dogs; (2) licensing of privately owned dogs; (3) proper control and compulsory muzzling of dogs, and (4) propaganda to ensure public co-operation.

—J. F. SHIRLAW.

SHARMA, M. R. (1942). **Rabies and its Control in India.**—*Indian Fmg.* **3.** 176–180. **997**

An article for the layman on the cause, symptoms, and epizoology of rabies, with measures for prevention and control. In the absence in India of effective legislation, vaccination should be resorted to.—J. F. SHIRLAW.

De Croos, A. V. (1942). **The Clinical and Microscopic Diagnosis of Rabies.**—*Indian vet. J.* **19.** 128–131. **998**

The author incriminates the musk rat [? musk shrew] and bandicoot as sources of infection in rabies in dogs, and this explains why some dogs which remain permanently within a house and its garden can contract rabies. The disease has no seasonal incidence.

Odd cases are quoted of rabies in dogs in which microscopic examination of the brain gave negative results, while animal inoculation tests were positive.

—P. R. K. Iyer.

Friedewald, W. F. (1943). **The Immunological Response to Influenza Virus Infection as Measured by the Complement Fixation Test. Relation of the Complement-Fixing Antigen to the Virus Particle.**—*J. exp. Med.* **78.** 347–366. **999**

F. has noted that a preliminary titration of complement in saline solution gave a different endpoint from a titration in virus-containing allantoic fluid or in immune serum. Sharp results in the complement-fixation tests cannot, therefore, be obtained unless this factor is recognized.

When the sensitivity of the test was thus increased, immune human sera which had previously been returned as negative, showed a low antibody content. Further tests with different viruses (PR8, WS, Lee, and swine strains) indicated that immune ferret sera reacted in highest titre with the homologous virus and that the related strains were clearly differentiated. Four fresh viruses from a recent outbreak of influenza A were practically indistinguishable from PR8, but were different from WS and swine strains when checked against ferret immune sera: on the other hand, the convalescent sera from the patients behaved quite differently since little or no strain specificity could be detected.

It was also found that the complement-fixing antibody consisted of two fractions, one of which was intimately associated with the virus particle; it sedimented at the same rate and was absorbed to chick red cells with the haemagglutinin fraction. The other component was smaller in size and was not removed by chick cells. These antigens differed in their reactions with ferret antisera, since the larger component seemed to be the more specific.—R. E. Glover.

Hirst, G. K. (1943). **Studies of Antigenic Differences among Strains of Influenza A by Means of Red Cell Agglutination.**—*J. exp. Med.* **78.** 407–423. **1000**

The red cell agglutination inhibition reaction is, owing to its simplicity and speed, an eminently suitable test for large-scale studies of strains of influenza virus and their corresponding antisera. There are, however, certain sources of error which must first be eliminated :– (a) the red cell suspension should preferably come from the blood of one fowl to avoid variations which arise when different birds are used [see Stuart-Harris—*V. B.* **13.** 424.], (b) where possible, pooled suspensions of virus should be avoided, and (c) immune serum from a single animal only should be used. Even when these precautions were taken, it was found that a correction had to be made for the " avidity " of the serum and a formula is given showing how this can be done.

An examination of strains isolated from the American 1940–41 epidemic failed to reveal any antigenic differences of significance. Earlier strains, however, such as WS, PR8, and several " type " English viruses, exhibited distinct differences of the order reported by other workers who relied on neutralization tests in mice.—R. E. Glover.

Stuart-Harris, C. H., Glover, R. E., & Mills, K. C. (1943). **Influenza in Britain, 1942-43.**—*Lancet.* **245.** 790–793. **1001**

During 1941–42, an examination of human sera and throat washings from suspected cases of influenza yielded negative results, an indication that no influenza virus infection of known type was current.

During 1942–43, several sporadic outbreaks were investigated. Sera tested by the Hirst technique [*V. B.* **12.** 379.] showed that of 114 pairs of sera (acute and convalescent bleedings), 52 showed no change, 12 a 2–3-fold increase over the normal, and 50 an increase of fourfold or greater, against influenza B virus. No rise against A virus was detected.

Attempts to recover virus from throat washings by inoculations amniotically into developing eggs were unsuccessful. Throat washings administered to ferrets failed to induce febrile or clinical reactions, but the presence of B virus was detected indirectly by a rise in serum antibody in some of the animals. Thus of 27 samples tested, 19 were negative for both A and B, but eight showed a 4–16-fold increase in titre of B antibody. The specificity was checked by neutralization tests in mice. These results emphasize the difficulty of establishing strains of influenza B virus.

The value and limitations of the Hirst technique are discussed.

Sharp, D. G., Taylor, A. R., Beard, D., & Beard, J. W. (1943). **Morphology of the Eastern and Western Strains of the Virus of Equine Encephalomyelitis.**—*Arch. Path.* **36.** 167–176. **1002**

Purified suspensions of E.E. viruses (Eastern and Western strains) were examined by electron micrographs. Measurements of the image diameters showed that the average size of both types ranged from 39·6 mμ to 58·8 mμ. These figures compare very favourably with those obtained by differential ultracentrifugation studies which point to a monodisperse liponucleoprotein complex with a sedimentation constant $S_{20°} = 273$ to $265{\cdot}5 \times 10^{-13}$, giving a particle size of from 50·4 mμ to 56·8 mμ.

The addition of $CaCl_2$ to the diluting fluid was particularly valuable in enhancing the contrast of the images obtained by electron micrography.

—R. E. Glover.

*Rossi, P. (1941). La vaccination du cheval contre l'encéphalomyélite infectieuse par l'emploi de " chick embryo vaccine ". Les réactions. **[Vaccination against Equine Encephalomyelitis with Chick-Embryo Vaccine]**.—*Bull. Soc. Path. exot.* **34.** 201–204. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 505]. **1003**

A brief discussion. No new material.—J. Francis.

Ratner, L. S. (1940). K voprosu o lokalizatsii virusa entsefalomielita loshadeĭ v organizme eksperimental'no zarazhennykh zhivotnykh. **[Localization of Equine Encephalomyelitis Virus in Animals]**.—*Veterinariya, Moscow.* No. 2. pp. 60–62. [French summary]. **1004**

Four groups, each consisting of five mice, were inoculated intracerebrally, intramuscularly, intravenously, and subcutaneously with E.E. virus passaged through rabbits and white mice. In all these mice, destroyed at varying intervals after infection, E.E. virus was demonstrated in the brain and spinal cord, but could not be detected in the liver, spleen, kidneys, testicles, urinary bladder, or heart.

In R.'s opinion, E.E. virus belongs to a group of specific neurotropic viruses. Disturbances of the respiratory organs, circulatory system, and of metabolism should be regarded as of a secondary nature.

—A. Moldawsky.

HASSAN, S. R., & IDNANI, J. A. (1943). **An Outbreak of Bovine Encephalomyelitis.**—*Indian J. vet. Sci.* **13.** 59–64. **1005**

In this outbreak, the first of its kind in the herd, 20 animals including 12 cows and five bullocks died. Symptoms were lethargy, muscular contractions, salivation, inappetence, and later incoordination and paresis of the hind limbs, and finally paralysis and collapse. The course of disease in individual animals was 3–7 days. It died out spontaneously. Histologically, the brain and spinal cord showed encephalomyelitis. In most cases, experimental transmission was successful in small laboratory animals by intranasal and subdural inoculations of suspensions of nerve tissue, and encephalomyelitis lesions were present in the brain and cord. The causal agent was presumably a virus.

—J. A. IDNANI.

MUNCE, T. W., & REICHEL, J. (1943). **The Preservation of Hog-Cholera Virus by Desiccation Under High Vacuum.**—*Amer. J. vet. Res.* **4.** 270–275. **1006**

Swine fever virus, as commercially available, consists of the phenolized, defibrinated blood of artificially infected swine. Its keeping qualities are not satisfactory and the official expiry date is 90 days after production.

When desiccated under high vacuum and stored *in vacuo* in flame-sealed ampoules, S.F. virus retained its infectivity for 328 days at 37°C. This 328-day period of infectivity was more than twice as long as for corresponding desiccated virus stored *in vacuo* in rubber-stoppered bottles at this temperature. It was approximately 15 times as long as for unpreserved, liquid virus from the same virus mixture stored at the same temperature, and it was approximately 23 times as long as for phenolized, liquid virus from the same virus mixture stored at this temperature.

S.F. virus of blood origin, desiccated under high vacuum and stored *in vacuo* in flame-sealed ampoules at 20°C. (approximately room temperature), was still infective in the last test, which was conducted after a storage period of 1,125 days. This period of infectivity, namely 1,125 days, is more than three times as long as for the corresponding unpreserved, liquid virus, and more than 12 times as long as for phenolized, liquid virus, all stored at the same temperature. Corresponding virus, desiccated under high vacuum and stored *in vacuo* in rubber-stoppered bottles at this temperature, retained its infectivity for 1,029 days.—JOHN FRANCIS.

IYER, S. G. (1943). **Studies on Newcastle (Ranikhet) Disease Virus.**—*Indian J. Vet. Sci.* **13.** 1–26. **1007**

This is an account of work most of which has been published elsewhere [see *V. B.* **11.** 604, 692 and **12.** 27.].—J. A. IDNANI.

I. ROSE, H. M., & MOLLOY, E. (1943). **Observations Concerning the Etiology of Primary Atypical Pneumonia.**—*Science.* **98.** 112–114. **1008**

II. SMADEL, J. E. (1943). **Atypical Pneumonia and Psittacosis.**—*J. clin. Invest.* **22.** 57–65. **1009**

III. SMADEL, J. E., WALL, M. J., & GREGG, A. (1943). **An Outbreak of Psittacosis in Pigeons, Involving the Production of Inclusion Bodies, and Transfer of the Disease to Man.**—*J. exp. Med.* **78.** 189–203. **1010**

IV. FAVOUR, C. B. (1943). **Ornithosis (Psittacosis). A Report of 3 Cases, and a Historical, Clinical, and Laboratory Comparison with Human Atypical (Virus) Pneumonia.**—*Amer. J. med. Sci.* **205.** 162–187. **1011**

I. Sputa, throat washings, and blood from cases of human primary atypical pneumonia were inoculated into a variety of laboratory animals and birds. The results were completely negative except in the case of recently weaned g. pigs in which a filtrable, transmissible agent was isolated from material from seven out of 11 patients. Successful transmission was secured by the intranasal route only, the main lesion being a disseminated bronchopneumonia reaching its maximum about 12–20 days after inoculation. No inclusion bodies, elementary bodies, nor rickettsia-like bodies were ever observed. Repeated passage failed to increase the virulence of the agent which was, however, transmissible from the g. pig to the cotton rat.

Serological tests indicated the identity of the g. pig and cotton rat strains, but tests with convalescent sera from human patients were inconclusive: on the other hand, g. pigs and cotton rats injected repeatedly with human material developed a partial immunity to the animal-adapted strains.

II. Continuing previous investigations into primary atypical pneumonia, S. investigated a series of cases sporadically distributed in large cities, with special reference to possible contact between patients and non-psittacine birds affected with one of the psittacosis group of viruses. In about 25% of the cases, presumptive evidence of infection with strains of this group was obtained as shown by a rise in serum antibodies against psittacosis. Lymphocytic choriomeningitis and influenza viruses respectively were eliminated as possible causes.

Since cross-reactions with human sera may occur with the viruses of lymphogranuloma, mouse pneumonitis, and meningo-pneumonitis, the term "psittacosis-lymphogranuloma" is suggested for the group. It is stressed that if the human disease is to be ascribed to a psittacosis virus, rigid criteria must be adopted.

III. This article covers most of the ground of II. A virus of the psittacosis-lymphogranuloma group was readily isolated from a flock of pigeons in which a severe epizootic had occurred. All strains except one were lethal for the mouse by the intracerebral route, but failed to cause death when injected intraperitoneally. They also produced pock-like lesions on the chorio-allantoic membrane of the hen's egg. An infection, indistinguishable from psittacosis, developed in persons attending the sick birds. On account of the existence of peculiar intranuclear inclusions of the herpetic type, it was thought that the strains responsible may not have been of the classical psittacosis virus.

IV. F. gives a useful historical survey of human interstitial bronchopneumonia with special reference to primary atypical pneumonia. Three cases are described with full clinical and other details. The results of various studies and serological tests suggested a close relationship with ornithosis (psittacosis). Human cases from which no agent has been isolated, may still be caused by a virus of this group which has become fixed in man and incapable of infecting other species, such as mice.—R. E. GLOVER.

JUNGEBLUT, C. W., & DALLDORF, G. (1943). **Epidemiological and Experimental Observations on the Possible Significance of Rodents in a Suburban Epidemic of Poliomyelitis.**—*Amer. J. publ. Hlth.* **33.** 169–172. [Authors' summary copied *verbatim*]. **1012**

A rodent-pathogenic virus which paralyzes albino mice, cotton rats, and hamsters was isolated from the brain of a house mouse found dead in the home of a fatal case of human poliomyelitis. Another rodent-pathogenic virus capable of inducing paralysis in albino mice, cotton rats, and hamsters was isolated from the brain stem of this fatal case. The two viruses, when passaged in albino mice, are similar in that both are completely inactivated by antisera against Theiler's virus of mouse encephalomyelitis and show some neutralization with convalescent sera from patients involved in this epidemic. They differ however mark-

edly in virulence for albino mice in that the human virus is much more potent than the mouse virus.

CARLSON, H. J., RIDENOUR, G. M., & MCKHANN, C. F., Jr. (1943). **Effect of the Activated Sludge Process of Sewage Treatment on Poliomyelitis Virus.**—*Amer. J. publ. Hlth.* **33.** 1083–1087. **1013**

It is known that poliomyelitis virus is excreted in the faeces and there is evidence that infection may occur *via* the gastro-intestinal tract. Investigations were therefore undertaken to ascertain the effect of the activated sludge process on the poliomyelitis virus. The results indicated that activated sludge in amounts as low as 1,100 parts per million removed or inactivated large amounts of virus after six hours' aeration.—J. F.

LURIA, S. E., DELBRÜCK, M., & ANDERSON, T. F. (1943). **Electron Microscope Studies of Bacterial Viruses.**—*J. Bact.* **46.** 57–77. **1014**

Two bacteriophages, α and γ, both active against *Bacterium coli* strain B [*V. B.* **14.** 122.] were studied in detail. The particles of virus α had a round " head ", 45–50 mμ. in diameter and uniformly darker in the photomicrographs, that is uniformly scattering for 60KV electrons. To this round " head " was attached a " tail " about 150 mμ. long and not more than 10–15 mμ. thick, which was either straight or slightly curved. The particles of virus γ had an oval " head " 65 × 80 mμ., in which various types of structures could be seen and a straight " tail " 120 × 20 mμ. Particles of a staphylococcus virus had a " head " about 100 mμ. in diameter, and a " tail " about 200 mμ. long. These sizes agree well with those inferred by some of the indirect methods.

Photomicrographs show that the virus particles were adsorbed on to the cell wall, but after lysis it was observed that the new virus is liberated from within the cell. It is not easy to explain this observation, but it may be that the infecting particles act through the cell wall, or that only one particle can enter the cell, the others remaining attached to its surface. There is as yet very little evidence in support of this latter view. The pictures give no indication as to whether the virus is produced in the interior of the cell or close to the inner surface of the cell wall. When the bacteria were lysed, besides the virus particles, uniform granular material 10–15 mμ. in diameter was liberated. If these granules are interpreted as molecules, their size corresponds to a molecular weight of 10^6. There was good quantitative agreement between the numbers of particles visible on the photomicrographs and the numbers predicted on the basis of growth experiments for which plaque count assays were used.

The literature dealing with electron photomicrographic studies of plant and animal viruses is quoted; in general these viruses appear to be simpler than the bacteriophages observed in this study.

Concluding a discussion on the nature of viruses, the authors conclude that while no harm is done by calling viruses " molecules ", such a terminology should not prejudice our views regarding the biological status of the viruses, which has yet to be elucidated.—J. F.

See also absts. **1029**, **1030** (vaccinia LS-antigen), **1051** (housedog disease).

IMMUNITY

TROITSKIĬ, V. L. (1942). Uspekhi sovetskoĭ mikrobiologii i immunologii za 25 let. **[Twenty-Five Years' Advance in Microbiology and Immunology in the U.S.S.R.]**—*Zh. Mikrobiol., Moscow.* No. 11/12. pp. 37–49. **1015**

The article deals with work related to diseases of human beings, and the developments made in this work in the U.S.S.R. during the last 25 years. Amongst other subjects, research has been carried out on dissociation of bacteria, antagonism and symbiosis of bacteria, bacteriophages, cell immunity, mechanism of antibody formation, and the role of the reticulo-endothelial system in infection.—A. MOLDAWSKY.

DEGARA, P. F., & ANGEVINE, D. M. (1943). **Reactions in Skin and in Internal Organs of Rabbits Sensitized with Streptococcus or with Pneumococcus Vaccine and Their Relationship to Antibodies.**—*J. exp. Med.* **78.** 135–150. **1016**

Rabbits were sensitized by single or repeated intracutaneous injections of heat-killed type I pneumococci and of formalin-killed haemolytic streptococci. At varying intervals thereafter, the animals were subjected to laparotomy under anaesthesia and homologous vaccine was injected into several abdominal organs. 24–72 hours later, the animals were killed for macroscopic and microscopic examination of the injection sites.

In most cases, liver and spleen injections resulted in local inflammation accompanied by necrosis, while kidney and anterior stomach wall injections caused haemorrhagic lesions, frequently accompanied by slight inflammation but seldom by necrosis. No correlation was found between abdominal organ and skin reactivity or between these two sets of reactions and the antibody titre of the serum. On the other hand, reactions were most intense in those organs (liver and spleen) from which most antibody could be extracted, a result suggesting the union of antigen and specific antibody in the tissues as the cause of the reaction.—J. L. McG.

BLANCH, H., & BLANCH, P. C. (1942). Nuevos aportes sobre la vacunación por via intradérmica. **[Fresh Views on Intradermal Inoculation]**.—*Rev. tuberc. Uruguay.* **10.** 259–278. [Abst. in *Tubercle, Lond.* **24.** 90 & 91, slightly smended]. **1017**

As the result of their investigations the authors found that the allergy caused by intradermal injection of BCG is early, intense and persistent. There is no reason for using the buccal route, as the resulting allergy is late and transient, or the subcutaneous route owing to the formation of suppurative nodules. Since 1938 the authors have employed multiple punctures which will form the subject of a subsequent paper.

DANIELS, M. (1943). **Delayed Tuberculin Reaction.** —*Lancet.* **245.** 600–602. **1018**

In seven out of 14 human cases which failed to react to initial injections of tuberculin (0·1 ml. of O.T., 1 : 1,000–1 : 100), a reaction developed at the site of the 1 : 100 dilution several weeks or months later (end-point, ten months). In all the cases but one, a re-test showed a high sensitivity to tuberculin (1 : 10,000 or less) whilst in several instances a clinical and/or radiological examination indicated a primary tuberculous infection. It is suggested that a delayed reaction may serve as a valuable indicator of a primary infection.

—R. E. GLOVER.

CORPER, H. J., & COHN, M. L. (1943). **Immunization Against Tuberculoprotein (Tuberculin) Anaphylaxis.** —*Amer. Rev. Tuberc.* **48.** 329–333. [Spanish summary]. **1019**

A series of graded increasing desensitizing doses of unheated tuberculoprotein ranging from about 0·07–4·0 mg. was intravenously injected into a series of g. pigs at daily intervals 3–6 weeks after they had

received a primary intravenous sensitizing dose of 6·2 mg. unheated tuberculoprotein. Animals so treated did not react anaphylactically to doses of protein (1–3 mg.) which proved lethal in undesensitized controls. No protective desensitization was produced by weekly protein injections. Further, transfusion of 10 ml. of blood from anaphylactically immunized animals to normal g. pigs, which received a primary sensitizing protein injection 24 hours later, resulted in passive protection against anaphylaxis for a period of three months. On the other hand, tuberculoprotein immune blood did not possess the power to protect g. pigs which were anaphylactically sensitive before transfusion took place, nor was the lethal anaphylactic activity of tuberculoprotein in hypersensitive g. pigs affected by the *in vitro* mixture of the protein with either hypersensitive or hypersensitive-immune blood. —J. Lochiel McGirr.

*Lasserre, A., Ukrainczyk, F., & Laborie, R. (1941). Note sur l'état actuel de la tuberculination du chien et du chat. **[Tuberculin Testing of Dogs and Cats].** —*Bull. Acad. vét. Fr.* **14.** 136–140. [Abst. from abst. in *Bull. Inst. Pasteur.* **41.** 50]. **1020**

The cutaneous, intradermal and intravenous tuberculin tests give easily read results which confirm each other. The ophthalmic and intradermal palpebral reactions are difficult to interpret. The intravenous injection of 1–1·5 ml. of tuberculin produces in the tuberculous dog a rise in temperature of 1–2° which appears one hour after injection and is maintained for 4–8 hours. The skin of a tuberculous cat does not appear to be sensitive to either the cutaneous or the intradermal injection of tuberculin.—H. I. Field.

Konst, H., & Watson, E. A. (1943). **Studies on Johne's Disease : Reactions to Johnin in Sensitized Guinea Pigs.**—*Amer. J. vet. Res.* **4.** 34–44. **1021**

G. pigs were sensitized with 10–50 mg. of bacilli by various routes. In the subsequent tests, both heat-concentrated and P.P.D. johnins were used and the 48-hour readings were considered the best. It was found that the intradermal, intracardial, and *per os* routes were of little or no value for the sensitization of g. pigs. After intraperitoneal and subcutaneous injections, more pronounced reactions of almost identical strengths were obtained.

The effects of bacilli suspended in (a) Sauton's fluid + saline and (b) liquid paraffin were compared. The liquid paraffin suspension given subcutaneously gave about the same result as the Sauton-saline suspension given intraperitoneally. The liquid paraffin suspension administered intraperitoneally gave slightly better results. When the g. pigs were injected intraperitoneally with 2·5 ml. of a calcium phosphate mixture 48 hours before the intraperitoneal injection of bacilli suspended in Sauton-saline approximately the same result was obtained as with bacilli suspended in liquid paraffin. The g. pigs showed fewer adverse effects following this method of treatment than after the injection of bacilli suspended in liquid paraffin and the authors consider it to be the most satisfactory. Sensitization was usually maintained at a fairly high level for 3–9 weeks.—John Francis.

Birkhaug, K. (1942). **Concurrent Development and Subsequent Dissociation of Anaphylaxis, Allergy and Immunity in Tuberculosis.**—*Acta med. scand.* **112.** 393–425. [In English]. **1022**

Of 12 tuberculoprotein-sensitized, BCG-immunized, tuberculin-desensitized, virulently infected g. pigs (the experimental procedures being carried out in the order stated), six were given intravenous injections of 0·96–4·80 mg. of BCG tuberculoprotein : all six died in acute anaphylactic shock and all exhibited P.M. evidence of a high degree of resistance to the virulent test infection. The remaining six animals of the group were then given ten intravenous doses of 0·096 mg. of BCG tuberculoprotein at 1-min. intervals, three receiving in addition a further intravenous dose of 2·8–4·8 mg. of protein (production of anti-anaphylaxis). None of these animals died at the time of injection, due to anaphylactic shock, nor later due to allergic intoxication.

When a second group of animals, consisting of 12 tuberculoprotein-sensitized, BCG immunized, virulently infected g. pigs, was subjected to the type of treatment outlined above, the following differences were noticed : their resistance to the virulent infection was much lower than those in the first group, and six animals in the anti-anaphylaxis group all died of acute allergic intoxication 10–12 hours after the anti-anaphylactic injections.

In a third group of virulently infected control animals, two died as a result of the infection and the remaining ten all succumbed to allergic intoxication following the intravenous injection of tuberculoprotein.

The general findings of this paper are similar to those of a previous publication [*V. B.* **14.** 124, abst. 798.], the particular conclusion here being that anaphylaxis, allergy, and immunity can be produced experimentally in one animal, and that these three phenomena can then be characterized as separate and apparently unrelated biological entities.—J. Lochiel McGirr.

Gottlieb, P. M., & Urbach, E. (1943). **Pollen Surveys in the United States : a Critical Review.**—*J. Lab. clin. Med.* **28.** 1426–1440. [Authors' summary slightly amended]. **1023**

A review of the existing fund of information regarding the distribution and pollination times of the pollinosis-producing plants in the United States reveals : (1) many states and large cities where no data or only inadequate data are available ; (2) certain unavoidable sources of error in the methods of investigation ; (3) common correctable deficiencies in the published reports which greatly diminished their value ; (4) an unwarranted emphasis, in some instances, on large numbers of species, rather than on those of clinical importance ; and (5) an emphasis on quantitative considerations unjustified by present clinical knowledge or applicability.

A correlated pollen survey based a simultaneous botanical observations, pollen counts, and clinical investigations is suggested. This should be done on a nationwide scale and according to a uniform technique.

There is discussion on plants the pollen of which is commonly mentioned in the literature in connexion with sensitization.

Levitov, N. N., & Nekhotenova, E. I. (1942). Skhemy immunizatsii i eksploatatsii syvorotochnykh loshadeĭ. Soobshchenie I. **[Immunization of Serum-Producing Horses. I].**—*Zh. Mikrobiol., Moscow.* No. 10. pp. 75–78. **1024**

Various methods of immunizing serum-producing horses were tested. The authors do not recommend a uniform method, but state that the technique should be adapted to individual horses and should vary according to the antigen used. The Wadsworth method combined with reinfusion of erythrocytes permits abundant bleeding and this is especially recommended for horses whose serum titre is at the maximum level for only 2–3 days and subsequently falls. In horses in which the maximum level is maintained for a longer period, bleeding three times with reinfusion of erythrocytes is recommended. In horses used for the preparation of diphtheria and especially dysentery antisera, it

is recommended that the immunization be begun 24–74 hours after bleeding, in order to reduce the doses and quantities of antigen injected.

Repeated bleeding with only partial re-infusion of erythrocytes and also the use of desensitizing doses of antigen in order to reduce shock phenomena were also tried on individual horses.—A. MOLDAWSKY.

BONDAREVA, N. V. (1942). Tapioka kak nespetsificheskiĭ razdrazhitel' pri giperimmunizatsii loshadeĭ. **[Tapioca as a Non-Specific Stimulant in the Hyper-immunization of Horses].**—*Zh. Mikrobiol., Moscow.* No. 10. pp. 78–79. **1025**

In order to increase antitoxin formation, B. injected a tapioca substitute prepared from potato starch into 16 horses producing diphtheria antiserum, 1% of the tapioca substitute being added to toxoid and antigen. It was observed that the serum titre in the horses improved on an average by 58·6% and reached its maximum level as early as the tenth day. No ill-effects were observed. It is stated that the tapioca substitute produces in horses a local and general reaction similar to that produced by aluminium hydroxide but less intensive.—A. MOLDAWSKY.

PROOM, H. (1943). **The Preparation of Precipitating Sera for the Identification of Animal Species.**—*J. Path. Bact.* **55.** 419–426. **1026**

The highest-titred and most specific antisera were obtained using an alum-precipitated antigen, [the preparation of which is described]; 1–2 inoculations of 10 ml. of antigen (equivalent to 2·5 ml. normal serum) were given intramuscularly. By the intravenous or intraperitoneal routes, only low titres were obtained. In a group of 165 rabbits, 84% required only 1–2 injections to give a satisfactory titre. Except in the case of closely allied groups, such as ox, sheep and goat sera, 100% of the rabbits requiring only one injection, 70% of the rabbits requiring only two injections, 47% of those requiring three injections, and none of those given four injections, gave specific antisera. This indicates the importance of reducing the number of injections.

Attempts to increase specificity by adsorbing non-specific antibodies and by using different fractions of the serum proteins as antigen, proved unsuccessful.

A suitable antiserum against an antigen consisting of an extract of horseflesh heated at 100°C. for one hour, could not be obtained, being of very low titre and quite nonspecific. Normal anti-horse serum was found to detect homologous antigen extracts heated for 30 min. at 70°C., but not at 80°C.—R. COOMBS.

WHEELER, K. M., STUART, C. A., RUSTIGIAN, R., & BORMAN, E. K. (1943). **Salmonella Antigens of Coliform Bacteria.**—*J. Immunol.* **47.** 59–66. **1027**

The data presented are the results of reciprocal agglutinations and adsorptions of selected coliform strains, including *Bacterium coli* and "*aerogenes*" strains, as well as para-colon and intermediate strains, that had been found to give strong somatic reactions with one or more antisera representing the 34 somatic antigens of the genus *Salmonella*. Strains were found which agglutinated with "single-factor" antisera (*S. hvittingfoss*, XVI; *S. cerro*, XVIII; *S. tel-aviv*, XXVIII; *S. urbana*, XXX), but which failed to adsorb agglutinins for the homologous strains, indicating that two antigenic components were present in these "single-factor" cultures. Strains were demonstrated with the XI antigen of *S. rubislaw*, and strains with partial or complete antigenic components of *S. paratyphi* (I, II), *S. onderstepoort* (XIV, XXV), *S. carrau* (XIV), *S. senftenberg* (I, XIX), and *S. worthington* (XXIII).—E. C.

ALMON, L. (1943). **The Significance of the Vi Antigen.**—*Bact. Rev.* **7.** 43–56. **1028**

An account is given of the occurrence of the Vi antigen, contained in the carbohydrate fraction of *Salmonella typhi*; its biophysico-chemical properties are discussed as well as the question of its multiplicity, its relation to virulence, its role in human infection, mouse protection and active and passive immunization of man, and its utilization as a diagnostic laboratory reagent.—R. O. MUIR.

SHEDLOVSKY, T., ROTHEN, A., & SMADEL, J. E. (1943). **The LS-antigen of Vaccinia. III. Physical-chemical Properties of LS-antigen and some of its Degradation Products.**—*J. exp. Med.* **77.** 155–164. [For previous parts, see *V. B.* **12.** 491]. **1029**

SMADEL, J. E., HOAGLAND, C. L., & SHEDLOVSKY, T. (1943). **The LS-antigen of Vaccinia. IV. Chemical Analysis of LS and the Effect of Chymotrypsin on LS.**—*Ibid.* 165–171. **1030**

III. Electrophoretic, ultracentrifugal, diffusion, and specific volume measurements of the previously described [see *V. B.* **12.** 491.] LS-antigen of vaccinia revealed that it possessed the following physical properties:– electrophoretic and centrifugal homogeneity, a partial specific volume of 0·72 ml. per g. at 4°C., a diffusion constant of $1{\cdot}50 \times 10^{-7}$ cm.^{2}/sec., a sediment-ation constant of 6·35 at 20°C., an iso-electric point of pH 4·8, a mol. wt. of 214,000, and an elongated molecular shape with an axis ratio of 1 : 20. Heated and alkali-treated degradation products retained their electrophoretic homogeneity, but were polydisperse on ultracentrifugal examination.

IV. Investigation of the LS-antigen by chemical and enzymic methods indicated that both the L- and the S-parts of the molecule were protein in nature and that the pure double antigen contained no lipids, phosphorus, nucleic acid, or glucosamine. Papain digestion destroyed both the L- and the S- activities of the antigen, while crystalline chymotrypsin destroyed the serological activity of the S-portion of the molecule without affecting the activity of the L-portion. This latter degradation product (LS″) was found, unlike LS, to form needle-shaped, crystal-like structures: it contained the same percentage of nitrogen as the parent double-antigen.—J. LOCHIEL MCGIRR.

CANNON, P. R., CHASE, W. E., & WISSLER, R. W. (1943). **The Relationship of the Protein-Reserves to Antibody-Production. I. The Effects of a Low-Protein Diet and of Plasmapheresis Upon the Formation of Agglutinins.**—*J. Immunol.* **47.** 133–147. **1031**

Experiments carried out with a mixed strain of rabbits indicated that hypoproteinaemia exerted an adverse effect upon antibody production, as determined by the response to salmonella vaccines. This was shown to be the case both in young rabbits receiving a low-protein diet and in adult rabbits rendered hypoproteinaemic by feeding a low-protein diet and, in some cases, by plasmapheresis as well. The agglutinin titres were significantly reduced as compared with those of normally fed controls.

The total serum protein of the normal new-born rabbit was found to be low (about 6·0 g. per 100 ml. in most instances), and the value was not raised during the first month of the suckling period. In the discussion, it is pointed out that it has long been known that the serum of the new-born calf is deficient in euglobulin until after the ingestion of colostrum, while more recent electrophoretic studies have shown the same to be true for the γ-globulin fraction.—ALASTAIR N. WORDEN.

GOLD, H., & BACHERS, H. (1943). **Combined Active-**

Passive Immunization against Tetanus.—*J. Immunol.* **47.** 335–344. **1032**

Combined active-passive immunization against tetanus appeared to have no adverse effects upon the duration and strength of the temporary protection conferred by passive inoculation. In fact, it appeared in some cases actually to prolong the passive immunity. On the other hand, it appears that the simultaneous injection of 1,500 units of antitetanic serum interfered somewhat with the active immunity ordinarily set up by the first dose of alum-precipitated toxoid ; especially was this the case when the fluid tetanus toxoid was used. This was probably due to the neutralization of the toxoid *in vivo*. This, however, could probably be overcome by additional doses of toxoid. The serum for the above was obtained from the blood of 35 young women, who had never received tetanus toxoid or antitetanic serum before the experiment.—R. COOMBS.

ELIZAROVSKIĬ, G. I. (1942). Vliyanie nizkikh temperatur na biologicheskie svoĭstva stolbnyachnovo anatoksina. **[Effect of Low Temperatures on the Biological Properties of Tetanus Toxoid].**—*Zh. Mikrobiol., Moscow.* No. 10. pp. 41–44. **1033**

It was found that the dried tetanus toxoid is more resistant to repeated freezing and thawing than aluminium hydroxide toxoid. In E.'s opinion, this should be taken into consideration for winter transport.

—A. MOLDAWSKY.

MIKHAĬLOV, A. I. (1942). Opyt ochistki i kontsentratsii antitoksicheskikh syvorotok. **[Purification and Concentration of Antitoxins].**—*Zh. Mikrobiol., Moscow.* No. 10. pp. 84–89. **1034**

In order to avoid serum disease in human beings, it is recommended that sera should be concentrated and freed from ballast proteins. In experiments made with 182 series of diphtheria, tetanus, and *Clostridium oedematiens* antisera preserved for 1–5 years, it was found that using BANZHAF'S method of precipitation with sulphate of ammonia, it was possible to concentrate the antitoxins 2–2·5 times, 46–56% of ballast protein being removed at the same time. By this method, 15–20% of antitoxin is lost, but some of the loss may be reduced by the additional treatment of sediment. The concentration and purification of sera preserved for 3–5 years is rather unsatisfactory, as loss of antitoxin amounts to 40–70%.—A. MOLDAWSKY.

SCHEIBEL, I. F. (1943). **Hereditary Differences in the Capacity of Guinea-Pigs for the Production of Diphtheria Antitoxin.**—*Acta path. microbiol. scand.* **20.** 464–484. [In English]. **1035**

The familial liability to diphtheria has long been recognized in man, and starting with an unselected stock of g. pigs, an attempt was made to develop a good and a bad antitoxin-producing strain. Males and females which had responded well to diphtheria antitoxin were mated, and others which had hardly responded were also mated. The young of these groups were tested for their response to diphtheria, the best of the first group and the worst of the second being selected for further breeding. This was continued for six generations, with the result that a good strain and a poor strain of antitoxin producers were developed. Whether the reaction was due to several hereditary factors or depended on a single gene, was not decisively evident from these experiments, but the strong influence of the inbreeding in the course of a few generations was not suggestive of any complicated gene construction.

There was no opportunity to try out the reaction of the two strains to other antigens, and thus it was not ascertained whether the demonstrated differences in faculty for immunization were specific for the diphtheria antigen. But the intercurrent deaths, which most often were due to pneumonia and in a few cases to pseudotuberculosis, were distributed evenly among the two strains in all generations, showing that the resistance to certain bacterial infections was independent of the hereditary factors governing the production of diphtheria antitoxin.—JOHN FRANCIS.

HAUROWITZ, F., & YENSON, M. M. (1943). **Quantitative Determination of Antigen, Antibody and Complement in Precipitates.**—*J. Immunol.* **47.** 309–313. **1036**

Complement-inactivated rabbit sera immune to arsanil-azo-sheep-globulin and arsanil-azo-ovalbumin were mixed with 3-5 ml. of active or inactive g. pig serum, or of saline solution. Varying amounts of 0·1–0·3% solutions of the appropriate antigens were added, and the mixtures were kept at 38°C. for 30 min. After freezing and thawing, the precipitates obtained by centrifugation were washed, dried, and weighed and then redissolved for the colorimetric determination of the amount of coloured antigen present. Haemolytic titres of the active g. pig serum and of the supernates from the precipitates were also determined.

The weight of precipitate obtained in the presence of active g. pig serum was found to be greater than in the presence of inactivated g. pig serum, the amount of complement fixed being 0·15–0·20 mg. per ml. g. pig serum. Neither antigen-antibody ratio, nor the absolute amount of antigen or of antibody in the precipitate was essentially altered by complement-fixation, the conclusion being that the determinant groups of antigen and the anti-hapten groups of antibody are not involved in fixation of complement. The amount of complement fixed was, in all experiments, approximately proportional to the weight of precipitate (amounting to about 20% of precipitate) and was apparently present as the result of nonspecific adsorptive mechanisms. The supernates of the precipitates were completely devoid of haemolytic powers, though only a small proportion of the complement-protein was bound in the precipitates, a possible explanation of this being that part of the complement was fixed by soluble antigen-antibody compounds. The high efficiency of complement as a haemolytic agent (6×10^4 molecules of complement-protein as compared with 10^{10} molecules of saponin or sodium oleate to produce haemolysis of a single red blood cell) is held to support the enzyme theory of complementary action.—J. LOCHIEL MCGIRR.

BERGER, F. M. (1943). **Clumping of Pathogenic Staphylococci in Plasma.**—*J. Path. Bact.* **55.** 435–440. **1037**

Evidence is put forward that coagulase is responsible for the phenomenon of clumping of pathogenic staphylococci in plasma, as well as that of coagulation of plasma —the basis of the coagulase test. The coagulase test was carried out as recommended by FISK. Slide agglutination tests were carried out with undiluted human plasma, and 125 strains were examined. Eighty-three of these, which were coagulase positive, were all clumped or " agglutinated " by plasma. A few coagulase-negative strains were also clumped, but these showed a different appearance from the coagulase-positive ; these were probably due to natural agglutinins in human plasma. When crude solutions of fibrinogen were used instead of plasma, all coagulase positive strains were clumped powerfully, whereas none of the coagulase-negative strains showed any trace of agglutination. This fibrinogen solution could be used for at least four weeks and showed complete agreement with the coagulase test.

When different fractions of plasma were tested,

including a prothrombin fibrinogen-free solution, none clumped the staphylococci except the fibrinogen fraction. The possible mechanism suggested by B. is that pathogenic staphylococci contain on their surface coagulase which is capable of precipitating fibrinogen on their surfaces, thus causing them to stick together. In B.'s experiment, the coagulase acted most readily on the CO_2-soluble fraction of fibrinogen, whereas the CO_2-insoluble fraction, constituting the greater part of fibrinogen of plasma, was coagulated only slowly. Conversely, almost the whole agglutinating property of the plasma was found to be contained in the CO_2-soluble fraction. The process does not involve an immune body. To show that the same substance, coagulase, was responsible for both reactions, *viz*, coagulation of plasma and clumping of the organisms in plasma, absorption tests were carried out.—R. C.

Savel'vol'f, G. B. (1942). Potentsiometricheskoe titrovanie normal'nykh i immunnykh loshadinykh syvorotok. [**Potentiometric Titration of Normal and Immune Horse Serum**].—*Zh. Mikrobiol., Moscow.* No. 10. pp. 69–75. **1038**

The globulin fraction in serum is regarded as not homogeneous. Whereas isostable globulin predominates in antitoxic sera, isolabile globulin predominates in antibacterial sera. The isostable and isolabile globulins of the same serum (normal and immune) differ in the binding of acids and alkalies.—A. Moldawsky.

Taylor, H. L., & Keys, A. (1943). **Fractionation of Normal Serum Proteins by the Electrophoretic and Sodium Sulfate Methods.**—*J. biol. Chem.* **148.** 379–381. **1039**

The authors present data on eight normal human sera studied by sodium sulphate and electrophoretic fractionation methods. The former technique was found to assign $5 \pm 3\%$ more nitrogen to the albumin fraction than did the latter, a result indicating that the amount of globulin carried over into the albumin fraction was greater than the amount retained by the globulin precipitate. From a survey of published results it is concluded that the correlation between the two techniques is less in pathological than in normal sera.—J. Lochiel McGirr.

See also absts. **957** (vole acid-fast bacillus), **971, 973** (immunity in brucellosis), **977-980** (— — clostridia infections), **999, 1000** (immunological reactions to influenza virus), **1045** (hydatid antigens).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Mills, H. B. (1942). **Montana Insect Pests, 1941 and 1942. Twenty-Ninth Report of the State Entomologist.**—*Bull. Mont. agric. Exp. Sta.* No. 408. pp. 36. **1040**

A "popular" account of the incidence of insect pests during 1941–42 in Montana. Most of the records are concerned with plant pests, but two animal pests are reported: the screw-worm (*Cochliomyia americana*) is recorded for the first time in the state, and the spinose ear-tick (*Ornithodorus megnini*) previously recorded in 1916 is again reported as present. Both these pests have been introduced on cattle imported from Mexico.—J. B. Cragg.

Kartman, L. (1943). **New Developments in the Study of Ectoparasite Resistance.**—*J. econ. Ent.* **36.** 372–375. **1041**

Little is known at present regarding the relation between specific dietary factors or vitamins and ectoparasite resistance. The once generally accepted contention, that the administration of vitamin A would mitigate the severity of infestation, is being discredited. Recent observations indicate that the vitamin B_2 complex is also connected with ectoparasite resistance. K. reviews present knowledge of the subject, and gives valuable suggestions for further work.—W. Moore.

Ewing, H. E., & Fox, I. (1943). **The Fleas of North America. Classification, Identification, and Geographic Distribution of These Injurious and Disease-Spreading Insects.**—*Misc. Publ. U.S. Dep. Agric.* No. 500. pp. 143. **1042**

This comprises a thorough taxonomic study of the fleas of North America, and covers over 260 species, subspecies, and varieties. The genera and higher groups are fully described; the morphological descriptions include very clear figures. Identification characteristics are given for all species, subspecies, and varieties, and references to their biology and economic importance are included.—J. B. Cragg.

Angus, W. R., Thomas, I., & Williams, O. G. (1943). **Field Experiments on the Control of Sheep Maggots.**—*Ann. appl. Biol.* **30.** 164–169. **1043**

The authors describe field experiments on some 4,700 sheep at 40 different farms in North Wales. The probability of tail strike was found to be eight times greater in uncrutched than in crutched lambs. Dipping trials showed that neither zinc arsenite nor calomel alone gives any better protection against strike than does a commercial dip. There was some evidence to suggest that calomel added to the commercial dip does increase its anti-strike properties.—J. B. Cragg.

Dalmat, H. T. (1943). **A Contribution to the Knowledge of the Rodent Warble Flies (Cuterebridae).**—*J. Parasit.* **29.** 311–318. **1044**

These rodent warble-flies are restricted to North and South America, where, in addition to their natural hosts, they may be found on the small domestic animals. In the present paper some gaps in the biology of these are filled in. Trapping experiments on a mouse population at Ames, Iowa, showed that at the height of the season, 38% of individuals might be parasitized, although the infestation tended to be localized and not scattered throughout the trapping area. Direct oviposition on the host has not been observed and D. considers that oviposition occurs near the burrows and other haunts of the host, and that the host is sought out by the larvae.—J. B. Cragg.

See also absts. **963, 964** (vectors of tularemia), **1131-1139** (insecticides).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

Pires, A. (1943). La intradermo-reacción en el diagnóstico de la hidatidosis. Antígeno preparado con polvo desecado de membrana prolígera y líquido hidatídico de quistes hidatídicos localizados en el hígado y pulmón de cerdos y bovinos. [**Diagnosis of Echinococcosis by the Intradermal Test, Using Antigen Prepared from Dried Proligerating Membrane and Fluid of Hydatid Cysts in the Lungs and Liver of Cattle and Pigs**].—*Rev. Med. vet., B. Aires.* **24.** 140–150. **1045**

P. describes the preparation from dried proligerating membranes and hydatid fluid of bovine and pig origin, of antigens for the diagnosis of hydatid disease in man.

The material is dried *in vacuo*, pulverized, washed in ether, and sterilized. The antigen is prepared for use by adding one part dried material to 200 parts distilled water. In five human cases tested, the reaction was found to agree with the Casoni test, readings being more rapidly obtained, although no more intense.
—Miller Watson.

Monnig, H. O. (1942). Skaapwurms in die Karo : die rol van Nematodirus. **[Worm Parasites of Sheep in the Karoo. The Role of** *Nematodirus***].**—*J. S. Afr. vet. med. Ass.* **13.** 111–112. [In Afrikaans : English ummary]. **1046**

Up to 1933, the dry Karoo was always considered as an area very little affected by worm parasites of sheep. in that year, which was a very dry one, much trekking occurred and sheep returning to the area brought various worm species with them. M. considers that the presence of *Nematodirus*, a worm occurring normally in the Karoo, lowered the resistance of the sheep and is thus responsible for the persistence of the introduced species. Tetrachlorethylene treatment is recommended, as although it is not really effective against pathogenic species such as nodular worms, it reduces the sheep's susceptibility by reducing the *Nematodirus* infestation.—E. M. Robinson.

Carmichael, J., & Bell, F. R. (1943). **Filariasis in Dogs in Uganda.**—*J. S. Afr. vet. med. Ass.* **14.** 12–15. [Including note by H. O. Mönnig, pp. 15–16]. **1047**

An obstinate dermatitis is described in dogs in Uganda and is attributed to filarial infection. The cases occurred in large breeds of dogs and were characterized by the occurrence of swollen, moist, desquamated areas of skin which later became necrotic, with or without sinus formation. The lesions were at first localized swellings which later exuded lymph, and crusts formed with squamous thickening. Filarial infection of the blood was found in a case which is described. The animal showed no improvement over a period of three months and there were lesions in all stages at the same time. No filariae were found in the lesions, but they were constantly present in the blood. Treatment, both local and general, was ineffective. The disease could not be transmitted.

In a footnote to the article, Mönnig mentions that *Stephanofilaria haeli* causes lesions of the legs of cattle in Malaya and *S. assamensis* causes " hump sore " of cattle in Assam. He considers that the filariae described by the authors resemble very closely those seen in the blood of dogs in the Pretoria area, which were not, however, associated with any skin lesions.
—E. M. Robinson.

See also abst. **1140** (phenothiazine).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Parsons, L. D. (1943). **Cellular Changes in Lymph Nodes of Experimental Mice with Special Reference to Plasma Cell Development.**—*J. Path. Bact.* **55.** 397–407. **1048**

The histology of the lymph nodes, with special reference to plasma cells, is described in the following groups of mice :- normal mice ; mice undergoing X-ray irradiation ; mice treated with a carcinogenic (" Mal.") compound but before tumour formation ; mice bearing tumours obtained (a) by injection of the Mal. compound (Mal. sarcomas) and (b) by treatment with methylcholanthrene ; mice bearing subcutaneous grafted tumours derived from (a) the methylcholanthrene sarcomas and (b) sarcoma 37 ; mice bearing intraperitoneal tumours derived as in the previous group ; mice undergoing treatment with bile salts.

Except in the last group, the experimental mice showed a widespread development of plasma cells, but the change was not a specific reaction to malignant growth. No evidence was found of the development of plasma cells from lymphocytes. Reticulosis was an early and constant feature, coinciding with the disappearance of lymphocytes. Changes in the proliferating fixed reticulum cells suggested that they might be the direct precursors of the plasma cells. The role of the changes in relation to neoplasia is discussed, and it is suggested that this increase of plasma cells may provide a pre-cancerous condition essential for the development of neoplastic growth on the application of a suitable stimulus.—E. Cotchin.

Donovan, H., & Woodhouse, D. L. (1943). **A Speculation on the Nature of the Chemical Structure which is the Essence of the Malignant Cell. [Correspondence].**—*Nature, Lond.* **152.** 509–510. **1049**

The authors suggest that a normal cell has as its essential basis molecules of nucleic acid which are joined by pyrophosphoric linkages to nucleotides which have a metabolic function. When cell division takes place, these latter may be replaced by nucleotides which are mirror images of the parent nucleic acid molecules and the whole molecule would then split into two symmetrical parts. In a malignant cell, some abnormality of the basic nucleic acid might cause the latter reproductive process to take place continuously without intermediate attachment of metabolic nucleotides and consequent normal metabolism of the cell.—R. M.

DISEASES, GENERAL

Barboni, E. (1939). Colesteridiosi intracellulare (Xantelasma da riassorbimento ?) nell'ilo splenico di un suino. **[Intracellular Cholesterosis (Xanthelasma) of the Hilus of the Spleen in a Pig].**—*Nuova Vet.* **18.** 27–35. [Abst. from abst. in *Tierärztl. Rdsch.* **47.** 154]. **1050**

In the substance of a pig's spleen, and in a pedunculated tissue mass at its hilus, were whitish or yellow lesions, composed of cells containing cholesterol crystals, cholesterol esters, and neutral fats. The spleen had twisted on its long axis, but the relation of this to the xanthelasma was not apparent.—E. Cotchin.

Whitney, L. F. (1943). **" Housedog " Disease.**—*Vet. Med.* **38.** 419–429. **1051**

This is the name W. gives to a disease confined almost wholly to dogs living in contact with human beings ; he considers that it is a separate entity from true canine distemper and canine influenza. It largely resembles the common cold of man, being a pharyngo-laryngotracheitis, but encephalitis is often a sequel. He states that it is one of the most important diseases of dogs in Connecticut and that more than 800 cases were observed in three years of practice. When uncomplicated it is mild, but often 1–4 weeks later various

nervous symptoms occur which are usually fatal. No dog left out of doors all the year round is known to have been affected, and these dogs do not contract the disease even when affected dogs are allowed to run with them. Kennel dogs, however, brought indoors in contact with affected dogs or sent in for shows contracted it. It is suggested that dogs may be infected from persons having colds or from affected dogs.

"Housedog disease" differs from distemper by its short course, localization in the throat, production of little or no mucous discharge from the eyes and nose, relatively slight rise of temperature, less prostration and the absence of inclusion bodies in the epithelial cells; solid immunity to distemper affords no protection. The disease differs from "influenza" by the severe throat symptoms, less prostration, less elevation of temperature and the complication of encephalitis. Little is known of the aetiology, but it is suggested that a virus may be responsible.

Breed susceptibility and treatment are discussed; no measures of value for treatment of the disease or the encephalitis have been found. [This article appears to be based on clinical observations.]—A. C. Jonas.

*Jármai, K., & Mócsy, J. (1940). Tuberkulose und Akropachie bei einem Pferde. **[TB. and Acropachia in a Horse].**—*9. Tagung Ges. Ung. Path., Budapest.* [Abst. from abst. in *Tierärztl. Rdsch.* **47.** 192]. **1052**

TB. of the spleen of a 2½-year-old horse was associated with lesions of acropachia on the limb bones above the carpal and tarsal joints, and multiple subcutaneous nodules composed of fibroblasts, endothelioid cells, and giant cells.—E. Cotchin.

Runge, W. (1943). Beobachtungen und Erfahrungen über "Erschöpfung" bei Pferden einer Infanterie-Division im West- und Ostfeldzug mit besonderer Berücksichtigung des ansteckenden Katarrhs der Luftwege. **[Observations on Exhaustion in Horses of an Infantry Division in the Western and Eastern Campaign with Special Reference to Infectious Bronchitis].**—*Z. Veterinärk.* **55.** 100–106. **1053**

The causes of exhaustion in horses on the western and eastern battlefronts are compared. The difficulties of procuring suitable and adequate food and water and the heavy demands made on the animals were common to both fronts, but whereas on the western front an infectious bronchitis was widespread, on the eastern difficulty was experienced in deciding whether the symptoms were entirely due to environmental circumstances or were attributable to an infectious agent.

In the west, the incidence of cases was greatest in October and fell to a low level in February, but on the other front cases were frequent in February, reached a peak in March, and thereafter declined. From the evidence discussed, however, R. considers that at least half the cases of exhaustion on the eastern front were complicated by infectious bronchitis.

Clinical symptoms are discussed in detail. The heart and lungs were mainly affected, the former showing all the various stages of compensation as the malady progressed.—N. S. Barron.

*Bouckaert, J. H., & Vandeplassche, M. (1941). **[Myositis of Masticatory Muscles in a Foal with Haemoglobinuria].**—*Vlaam. Diergeneesk. Tijdschr.* **9-10.** 153–156. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 330]. **1054**

After a railway journey, a nine-month-old foal showed swelling and subsequent atrophy of the masseter muscles, preventing normal opening of the mouth. Protein-rich, acid, copper-brown urine was present in the urinary bladder, and the blood appeared concentrated, with an increase in pyroracemic acid from 0·4–2·1 mg. %. Healing followed in 14 days, after administration of Betaxin (a vitamin B_1 preparation) and glucose. Similar cases are seen in Holland at the end of winter, and are well recognized in Belgium. The cause is thought possibly to be a vitamin B_1 deficiency.—E. Cotchin.

Quin, J. I., & Dorê, J. L. (1943). **A Skin Condition in Cattle Probably Associated with Photosensitisation.**—*J. S. Afr. vet. med. Ass.* **14.** 10–11. **1055**

A condition is described in cattle in the highlands of Natal, which appears to be a form of photosensitization. The cases, with one exception, occurred in female Friesland cattle grazing on open grass veld. They were sporadic in occurrence and spread over a wide area; the cause could not be determined. The first symptoms noticed were abdominal pain accompanied by diarrhoea and followed by a rapid loss of condition. All the white portions of the skin were swollen and tender, particularly on the back. Stiffness resulted from implication of the skin of the legs. The skin subsequently hardened and cracked, yellow fluid exuding. Subsequently, extensive necrosis of the affected skin occurred. Marked sensitiveness to sunlight was shown. In mild cases there was little scarring, but in severe ones marked scarring did occur in some cases and permanent hairless patches resulted. There was slight evidence of jaundice in the acute stage, but there were no fatal cases.—E. M. R.

Dykstra, R. R. (1942). **Control of Sheep Diseases.**—*Circ. Kans. agric. Exp. Sta.* No. 212. pp. 19. **1056**

This circular is intended for stockowners in Kansas and deals with the sheep diseases of that state only. These are:—pregnancy toxaemia, abortion, lamb dysentery, blackleg, malignant oedema, polyarthritis, tetanus, "pink eye", pox, stomach bloat, "bighead", foot rot, haemorrhagic septicaemia, overeating, maggot infestation, sheep scab, tick and lice infestations, helminthiasis, and "gid". No new information on these diseases is given.—D. D. Ogilvie.

Pande, P. G. (1943). **Pleuropneumonia in Goats with Special Reference to Pasteurella Infection.**—*Indian J. vet. Sci.* **13.** 44–58. **1057**

The paper deals with an enzootic form of pleuropneumonia occurring in goats at a goat-breeding farm in the United Provinces. It is said to resemble closely the condition described by Kolayli *et al.* [*V. B.* **5.** 693.] in Anatolia. An organism belonging to the pasteurella group, closely resembling Jones' group III, was isolated from the lungs, pleural effusion, blood, and nasal discharge of affected animals. Goats, sheep, and buffalo calves could be infected by contact and by feeding of infective lung material and culture. A formolized vaccine prepared from hepatized lungs and from cultures is said to have given encouraging results.—M. K. Sreenivasan.

McCay, C. M., Sperling, G., & Barnes, L. L. (1943). **Growth, Ageing, Chronic Diseases, and Life Span in Rats.**—*Arch. Biochem.* **2.** 469–479. **1058**

In a continuation of earlier studies [McCay *et al.*—(1939). *J. Nutrit.* **18.** 1.], it was found that rats could be retarded in growth by limiting the food intake for as long as 1,150 days, and still be capable of resuming growth when provided with an adequate calorific intake. Retarded males remained fertile much longer than the control animals receiving the same amount of vitamin E but much more carbohydrate. Retarded rats were found to be more resistant to chronic diseases than those that grew normally, and it was observed that females were more resistant than males to chronic lung disease.—Alastair N. Worden.

FRANCIS, J. (1943). **The Aetiology of Respiratory Diseases.**—*J. R. Army vet. Cps.* **15.** 9–10. **1059**

Theories regarding combinations of virus and bacteria in the aetiology of respiratory diseases are discussed. That such combinations are necessary is supported by Shope's work on swine influenza and recent views on the common cold. It is suggested that a similar type of combination may occur in strangles.
—D. D. OGILVIE.

MOORE, F. D., & TOBIN, L. H. (1942). **Studies with Radioactive Di-azo Dyes. I. The Localization of Radioactive Di-brom Trypan Blue in Inflammatory Lesions.**—*J. clin. Invest.* **21.** 471–481. **1060**

These studies were begun in the hope of finding a radio-active colloidal dye which would localize in inflammatory areas and be sufficiently radioactive to be detected from outside the body with the aid of a Geiger counter. Radio-active di-brom trypan blue was used in experiments with rats and rabbits, the distribution of the dye in the normal animal was studied, and experiments were then conducted with rabbits affected with induced staphylococcal abscesses. It was found possible to diagnose in every case the location of abscesses on the legs or in the subcutaneous tissues of the abdominal wall; deep abdominal lesions were detected in 77% of the cases in which they occurred.
—ALASTAIR N. WORDEN.

VAN DRIMMELEN, G. C. (1942). **Lameness in a Stud Cattle Herd Possibly of Hereditary Origin.**—*J. S. Afr. vet. med. Ass.* **13.** 105–110. **1061**

A number of cases of a progressive unilateral lameness of one hind leg in a pedigree Friesland herd are described; the evidence pointed to an hereditary aetiological factor. A stiffness developed and was of the nature of an excessive extension of the affected leg. Five cases were under observation, four of which were fatal. The affected limb did not carry any weight and the toe dragged on the ground. Atrophy of the gluteal muscles resulted. The stock was derived from an inbred herd established over a century ago and close line breeding had occurred since. The cases occurred in one bull and about 8% of his progeny.—E. M. R.

*STANG, V. (1940). Gehäuftes Vorkommen von erblicher allgemeiner Gelenksverkrümmung in Verbindung mit Gaumenspalt beim Rind. **[Hereditary Generalized Bent Joints and Split Palate in Cattle].**—*Z. Tierz. ZüchtBiol.* 280. [Abst. from abst. in *Tierärztl. Rdsch.* **48.** 51]. **1062**

The condition was transmitted by 38 healthy heifers, daughters of one bull, to nine of their 44 calves, progeny of a second bull related to the first.—E. C.

SURRARRER, T. C. (1943). **Bulldog and Hairless Calves.**—*J. Hered.* **34.** 175–178. **1063**

Hairlessness in a calf is described; the inheritance of this defect is postulated to be a simple Mendelian recessive. A description of, and a discussion on, the occurrence of "bulldog" characters in three related Jersey calves from inbred matings are also given.
—N. J. SCORGIE.

See also abst. **959** (bovine pyelonephritis).

NUTRITIONAL AND METABOLIC DISORDERS

ALIKAEV, V. A., & BEREZOVSKIĬ, A. A. (1940). Zoogigienicheskaya otsenka zelenovo korma, konservirovannovo khimicheskim sposobom. **[Hygienic Evaluation of Chemically Preserved Green Forage for Cattle].**—*Veterinariya, Moscow.* No. 2. pp. 98–107. [French summary]. **1064**

Comparative studies were made for more than four months on two groups of dairy cows; one group was fed on green food preserved with hydrochloric acid and sodium sulphate, according to the recommendation of ZUBRILIN (1937), and the other on the same green food preserved in ordinary silos. Although the experimental group was purposely fed on large quantities of forage containing a high percentage of preservatives, and received insufficient additional hay and minerals, no ill-effects were observed except for a slight increase in Ca elimination in the urine. Owing to this fact, the authors recommend the additional feeding of 2–2·5 kg. hay per 100 kg. body weight and Ca in an adequate proportion. It is also recommended that the ration of preserved food should be reduced in pregnant cows.
—A. MOLDAWSKY.

HENSON, P. R., HEIN, M. A., HAZEN, M. W., & BLACK, W. H. (1943). **Cattle Grazing Experiments with Sericea Lespedeza at Beltsville, Maryland.**—*J. Anim. Sci.* **2.** 314–327. **1065**

Sericea lespedeza is recognized as a valuable legume for erosion control, and may produce relatively high yields of easily cured forage on infertile acid soils. The results of four years' grazing on this perennial with beef steers show, however, that by itself it is not a satisfactory grazing crop. Yearling steers failed to make good live weight at any time; two- and three-year-old steers ate the forage readily, but good weight gains were recorded only during July and August. Steers grazed on sericea consistently consumed more salt than those on other pasture. Chemical analyses of sericea herbage showed low total ash and phosphorus content. Feeding of mineral supplements did not contribute to increased weight gains, and it is suggested that sericea is either lacking in nutrients essential to satisfactory weight gains or contains some inhibitory substance.—N. J. SCORGIE.

TEMPERTON, H., & DUDLEY, F. J. (1943). **Feeding Processed Kitchen Waste to Laying Pullets.**—*Harper Adams Util. Poult. J.* **28.** 59–62. **1066**

Three experimental groups were formed, birds being housed in cages in a battery house. Rations were adjusted to contain an equivalent amount of dry matter, it being assumed that three parts by weight of swill were equal to one part of mash.

Group 1 was a control group fed on normal balanced laying mash. Group 2 was fed on a ration in which processed kitchen waste amounted to approximately 60% of the daily dry matter requirement, and Group 3 on a ration in which it amounted to approximately 80%.

Results were observed for six months. Egg production in group 3 was markedly lower than in the other two groups between which there was no significant difference. All groups lost weight particularly the one receiving most swill.

A few birds in all three groups developed leg weakness and lameness. The possibility of dietary deficiencies was ruled out after various minerals and vitamin D had been fed with no noticeable improvement, but most cases recovered completely after seven days in cages with solid wooden floors. It was thought that the condition was due to individual incompatibility to prolonged confinement on wire floors.—J. D. BLAXLAND.

WRIGHT, M. M., & DUDLEY, F. J. (1943). **Feeding of Town Food Waste and Steamed Potatoes to Laying Ducks.**—*Harper Adams Util. Poult. J.* **28.** 63–65. **1067**

Groups of ducks were fed on rations in which from 50%–100% of the dry matter was provided by town

food waste or by equivalent parts of town food waste and steamed potatoes.

Rations were computed to contain an equal dry matter basis, it being assumed that three parts by weight of town food waste and four parts of steamed potatoes were required to replace one part of mash.

Birds fed on a ration, in which 50% of the mash was replaced by an equivalent quantity of town food waste or 25% town food waste and 25% steamed potatoes, gave a higher egg production, although final body weight was slightly lower than a control group fed entirely on mash. The experiment ran for 28 weeks.

At the higher replacement levels, *i.e.* 70, 75, and 100% of the mash replaced, ducks were affected by leg weakness, went out of production and lost condition rapidly; there were also several deaths. Leg weakness developed approximately nine weeks after the commencement of the experiment.—J. D. BLAXLAND.

*KRZYWANEK, F. W., & BRÜGGEMANN, J. (1941). Stoffwechselversuche mit alleiniger Verfütterung von Lecksuchtheu an kranke und gesunde Ochsen. 2. Der Stoffwechsel der organischen Substanzen bei einem erkrankten Ochsen. 3. Der Stoffwechsel der organischen Substanzen bei einem gesunden Ochsen. **[Metabolic Experiments with Diseased and Healthy Oxen on a Diet of Hay which causes Pica. II. Metabolism of Organic Substances in a Sick Ox. III. Metabolism of Organic Substances in a Healthy Ox].** —*Biederm. Zbl. B. Tierernährung.* **13.** 341–357 and 358–375. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 427]. [For part I, see *V. B.* **11.** 120]. **1068**

II. A two-year-old ox which had shown symptoms of pica in the winter of 1935–36 was fed from July 1936 to June 1937 on hay from a pica region. Metabolism studies were made in December, April, and June. Food and water intakes were considerably diminished. The digestibility coefficients for dry matter, organic matter, N and crude protein, fat, fibre, and N-free extractives, were relatively high in the first experiment but very low in the two later studies. From April there was reduced food intake and poor absorption; the animal did not receive sufficient calories or organic nutrients, and death occurred from failure of nutrition.

III. A healthy two-year-old ox previously on pasture was given hay from a pica region from September 1937 to June 1938 and metabolism studies were made for ten-day periods during October, January, and June. The food consumption increased until January and then decreased. Water intake showed no notable changes. The digestibility coefficients for all food constituents gradually decreased. The N balance became negative. The condition of this animal resembled that of the ox which had been affected with pica before being given the diet of hay, and severe cachexia developed which would have caused death if the animal had not been treated.—A. M. COPPING.

KRZYWANEK, F. W., & BRÜGGEMANN, J. (1942). Stoffwechselversuche mit alleiniger Verfütterung von Lecksuchtheu an kranke und gesunde Ochsen. Vierte Mitteilung. Der Stoffwechsel der anorganischen Substanzen bei einem erkrankten Ochsen. Fünfte Mitteilung. Der Stoffwechsel der anorganischen Substanzen bei einem gesunden Ochsen. Sechste Mitteilung. Ergänzungen und Schlussfolgerungen. **[Metabolic Experiments with Diseased and Healthy Oxen on a Diet of Hay which Causes Pica. IV. Metabolism of Inorganic Substances in a Sick Ox. V. Metabolism of Inorganic Substances in a Healthy Ox. VI. Supplements and Conclusions].** —*Biederm. Zbl. B. Tierernährung.* **14.** 1–28, 29–50 and 51–64. [Absts. in *Nutr. Absts. Revs.* **12.** 436, slightly amended (pts. IV & V), copied *verbatim* (pt. VI). Signed W. GODDEN]. [See also II & III, above]. **1069**

IV. Mineral metabolism was studied in the ox suffering from pica described in part II (above). In the first metabolism period, the total ash showed a positive balance but the balance became negative in the second and third periods. The Na and Cl balances were negative in all three periods and the K balance varied, being positive in the first and last periods and negative in the second. There was no regular relationship between the metabolism of these three elements.

The Ca and P balances were positive at first but became negative, while Mg showed a positive but rapidly decreasing balance throughout. The balance of these elements could not be related to the Ca and P ratio of the hay.

The S metabolism ran parallel with N metabolism reported in part I [see *V. B.* **11.** 120].

Balances of Fe and Mn tended to deviate from normal but the Cu balance was positive throughout. There was no evidence in this case that Cu deficiency had any influence on the onset of the disease.

V. Similar studies of mineral metabolism were made on the ox described in part III (above). In spite of a high total ash intake the balance in the first period was negative; it improved in the second and third periods, probably owing to better utilization. As for the sick ox the balances of Na, K and Cl were not uniform. The Ca, P, and Mg balances were negative in the first period but improved subsequently.

The S balance again ran parallel with that of N. The Mn balance was negative throughout in spite of a relatively high intake. The Fe and Cu balances improved throughout and became positive in the last period.

VI. From a study of the alkalinity of the urine, and of its ash, of the acidity of the distillate from the steam distillation and the C, N and vacat-O of the urine it was shown that the feeding of the faulty hay was quickly followed by a change in the intermediary metabolism, which was impaired by the using up of the C, and also by an increased excretion in the urine of energy containing organic compounds. The observed disturbances were not in every case the result of an acidosis.

The series of experiments point to the fact that, with sick animals during prolonged feeding on faulty hay, the utilisation of the organic food constituents became poorer, parallel to a fall in their digestibility coefficients, and at the same time there was a marked disturbance in the mineral metabolism. The disease was therefore the result of a complex disturbance of the metabolic processes and could not be attributed to a deficiency of any one single food constituent. Finally the possibility is suggested that, although in a normal ruminant on a normal diet a deficiency of vitamins of the B complex is not likely to arise, with a faulty diet of the type under consideration, the synthesis of these vitamins in the rumen may be impaired and thus indirectly a deficiency of one or more members of the B complex may arise.

KRZYWANEK, F. W. (1942). Stoffwechselphysiologische Untersuchung bei der Lecksucht des Rindes. **[Metabolic and Physiological Investigation on Pica in Cattle].**—*Tierärztl. Rdsch.* **48.** 162–167. **1070**

A summary is given of the results of several years' study of metabolic problems of cattle affected with "lecksucht". The results have already been given [see preceding group of absts.].—A. M. COPPING.

*FERRIANI, G. (1942). Ricerche sul rachitismo sperimentale del "Gallus domesticus" e sui fenomeni

degenerativi della ghiandola dell'uropigio. **[Research on Experimental Rickets in Fowls and on Degeneration of the Uropygial Gland].**—*Biochim. Terap. sper.* **29.** 129–148. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 479]. **1071**

In fowls made rachitic on McCollum's diet, removal of the uropygial gland did not affect the course or cure of the rickets. On the other hand, the development of rickets was associated with cornification of the gland. This was considered likely to be due to correlation between the action of vitamins A and D, since cornification of epithelium is characteristic of vitamin A deficiency.—A. M. Copping.

Sweeten, M. M. O. B. (1943). **Vitamin E Deficiency in the Rat. V. Uterine Changes in Chronic Deficiency.**—*Biochem. J.* **37.** 523–525. **1072**

The brownish discoloration of the uterus produced in rats by long-continued deprivation of vitamin E was not cured by subsequent administration of the vitamin. If, however, a successful pregnancy accompanied the dose of vitamin E the pigment disappeared from the uterus. It is suggested that the increased circulation in the uterine muscle is responsible for the removal of the pigment.—A. M. Copping.

Mason, K. E. (1942). **Changing Concepts of the Antisterility Vitamin (Vitamin E).**—*Yale J. Biol. Med.* **14.** 605–617. **1073**

A review dealing with certain aspects of relevant research up to 1942. It is concluded that in experimental vitamin E deficiency, lesions of the vascular system occur in the chick and foetal rat; of skeletal muscle in the duckling, g. pig, rabbit, goat, sheep, kangaroo, dog, nursling and adult rat, and mouse; of smooth muscle in the turkey (gizzard) and rat (uterus and seminal vesicle).

[The references to vitamin E deficiency in ruminants are based on findings in such conditions as "cod liver oil injury" (see *V. B.* **13.** 63, abst. 405.) and not upon experiments involving the use of a basal vitamin E deficient diet. Thomas & Cannon (see *V. B.* **9.** 798.) have reported that goats have thrived and reproduced for several generations on rations free from vitamin E as shown by rat test methods.]—Alastair N. Worden.

Swank, R. L., & Jasper, H. H. (1942). **Electroencephalograms of Thiamine-Deficient Pigeons.**—*Arch. Neurol. Pyschiat., Chicago.* **47.** 821–827. **1074**

Electroencephalograms were taken without anaesthesia after previous preparation of the head, *i.e.* after removal of all muscular attachments to the calvarium, and the making of two small trephine holes which did not penetrate the inner table. The brain potentials of normally fed pigeons (of which several species are stated to have been used) had a predominant regular frequency of 25–35 per sec., and an amplitude of 10–40 microvolts. When the birds were subjected to vitamin B_1 deficiency, the brain potentials showed a progressive increase in amplitude, and a complex change of frequency with lower frequencies becoming more prominent. The changes are thought to have indicated marked facilitation of cortical discharge during the initial stages of deficiency, and finally a depression. The administration of vitamin B_1 resulted in a change towards normal brain potentials, the effect being rapid in mild deficiency but taking 14–17 days in extreme deficiency.—A. N. W.

Ransone, B., & Elvehjem, C. A. (1943). **The Value of Biotin, Folic Acid Concentrates, and Liver Extract in the Diet of Rats fed Succinylsulfathiazole.**—*J. biol. Chem.* **151.** 109–115. **1075**

In earlier experiments it had been shown that liver extract counteracted some of the adverse effects upon the growth of rats fed sulphaguanidine as part of a synthetic ration [see Black *et al.*—*V. B.* **12.** 167]. In the work reported in the present paper, folic acid concentrate was found to replace most of the activity of liver extract. Biotin showed an activity additional to that of folic acid or liver extract, but xanthopterin was inactive.—Alastair N. Worden.

Andrews, F. N., & Erb, R. E. (1943). **Ascorbic Acid-Gonadotropic Hormone Relationships in the Chick.**—*Endocrinology.* **32.** 140–144. **1076**

Ascorbic acid when injected into male White Leghorn chicks, under the conditions of this experiment, had no effect on testis weight. Gonadotropin alone significantly increased the weight of the testis, bu varying levels of ascorbic acid administered in conjunc tion with the hormone, did not augment the effect of the latter. Injection of ascorbic acid produced a marked rise in the ascorbic acid content of the blood plasma. A seasonal variation in content was observed, the values obtained being considerably higher in March than in May, both in the control and experimental chicks. There was no apparent relationship between the blood plasma ascorbic acid and the testis weight.—E. C.

See also abstr. **1058** (regulation of growth and ageing by diet), **1093**, **1094** (iodinated proteins), **1054** (B_1 deficiency), **1041** (vitamins and ectoparasite resistance).

PHYSIOLOGY AND ANATOMY

Kelly, P. L. (1943). **The Lipolytic Activity of Bovine Mammary Gland Tissue.**—*J. Dairy Sci.* **26.** 385–399. **1077**

The lipolytic activity of 19 bovine mammary glands was investigated; four of the glands which had not been developed by pregnancy contained only traces of active lipase whereas the fully developed glands, whether actively secreting or non-lactating, contained significant amounts of lipolytic enzyme.

Dried defatted samples of mammary tissue retained a high percentage of their original lipolytic activity. Various substrates were used including mammary gland fat and tributyrin.

The pH of mammary tissue was studied histochemically and by the glass electrode method. The glands developed by pregnancy were found to be more acid than the undeveloped glands as one would expect if *in vivo* there was active lipase present in the gland.

Some evidence was obtained of a recombination of free fatty acids by enzyme action.—Alfred T. Cowie.

Brody, S. (1943). **Growth and Development with Special Reference to Domestic Animals. LVI. The Influence of Dairy Merit, Body Size, and Plane of Nutrition on the Economy of Milk Production.**—*Res. Bull. Mo. agric. Exp. Sta.* No. 366. pp. 31. **1078**

Kibler, H. H., & Brody, S. (1943). **Growth and Development with special Reference to Domestic Animals. LVII. An Index of Muscular-Work Capacity.**—*Ibid.* No. 367. pp. 20. **1079**

Brody, S., Kibler, H. H., & Trowbridge, E. A. (1943). **Growth and Development with special Reference to Domestic Animals. LVIII. Resting Energy Metabolism and Pulmonary Ventilation in Growing Horses.**—*Ibid.* No. 368. pp. 14. **1080**

LVI. The aim of the work reported was to formulate a statistical method for evaluating economy of milk production, which would serve as a yardstick for selecting cows of high lactational ability. Dairy merit is defined as the ratio of milk produced to feed consumed. It is shown that if dairy merit and other conditions are

equal, the monetary profit per unit of milk produced per cow, and for the herd, increases very rapidly with increasing size of the cows. Other conditions in actual practice are not, however, equal, and the sources of inequality are discussed.

LVII. The oxygen consumption rate in horses during rest and work on a treadmill was found to be related to pulse rate and body weight, and measures of cardiorespiratory capacity were computed. Among the more important findings were the following :– O_2 consumption is directly proportional to body weight in mature horses of different size. Oxygen pulse (O_2 consumption per min. divided by pulse rate per min.) tends to be directly proportional to body weight in mature animals of different species. Oxygen pulse per kg. of body weight tends to be constant for all body weights, but appears to vary with training and muscular-work capacity in horses ; oxygen pulse per kg. of body weight may thus be taken as an objective index of work capacity. When oxygen pulse per kg. is high during rest and shows a normal rise during work, work capacity is assumed to be high ; when this is low during rest and work, work capacity is assumed to be low. The index values found for horses were compared with index values computed for athletes and sedentary men.

LVIII. Data are presented in numerical and graphical form, with critical discussion, for the resting energy metabolism and pulmonary ventilation in relation to body weight in growing Percheron horses and Shetland ponies. The results are compared with similar data on cattle. The pulmonary ventilation rate was found to increase with, approximately, the $\frac{2}{3}$ power of body weight in horses, and with $\frac{3}{4}$ power of body weight in cattle. The resting O_2 consumption during the first two years of life increased with the 0·53 power of body weight in horses, and the 0·60 power in cattle. Possible reasons for the much higher ventilation rate in relation to O_2 consumption in horses and cattle than in man are discussed.—N. J. Scorgie.

Duran-Jorda, F. (1943). **Formation of Red Blood Corpuscles.**—*Lancet.* **245.** 186–188. **1081**

Following his previous article on this subject [see *V. B.* **13.** 437.], the author amplifies and to some extent alters his views on the formation of red blood cells. In intra-uterine life, the r.b.c. are extruded from plasma cells. [This process is described in his previous article.] In extra-uterine life, haemopoesis is considered to occur in the following manner. Lymphocytes in the gastric and intestinal mucosa by karyokinesis of the nuclei become fully developed eosinophile cells. These eosinophile cells enter the bloodstream and are carried to the haemopoietic organs. The eosinophile elements are then extruded as r.b.c., the protoplasmic remnants being expelled to become platelets. The remaining nucleus becomes a lymphocyte again. These lymphocytes probably then return to the gastric and intestinal mucosa, so completing the cycle. The article is accompanied by a number of photomicrographs. [The theory propounded by this author will be so startling to many haematologists that they will be well advised to consult the original article and to form their own conclusions.]—D. L. Hughes.

Claude, A. (1941). **Particulate Components of Cytoplasm.** *Cold Spring Harbor Symposia on Quantitative Biology.* **9.** 263–270. Discussion pp. 270–271. Cold Spring Harbor, L.I., N.Y. : The Biological Laboratory. [4to]. **1082**

A study was made of the microscopic and submicroscopic granules which can be separated from tissue extracts by means of differential centrifugation at high speed. The material obtained from various types of tissues appeared to be composed of small granules visible, under dark-field illumination, as refractile bodies of nearly the same size and showing Brownian motion. The data refer mainly to particles isolated from chicken tumour I tissue and from g. pig liver ; the particles ranged in size between 50 and 200 mμ. The physical and chemical properties of these particles are similar to those of particles isolated from other animal tissues and results of analyses indicate that these particles had a uniform chemical composition irrespective of the tissues from which the granules were derived. The particles were found to be composed essentially of two main portions, one lipoid and the other largely protein in nature, having the general composition of a phospholipid-ribonuclear protein complex. It was also found that appreciable amounts of Cu were present in cytoplasmic granules from cells from various sources and it appears that the Cu is associated with a protein. Particulate elements of this general composition thus appear to be present in normal and tumour cells. Evidence is presented which indicates that the purified granules are free mitochondria.—R. Allcroft.

Sigurdsson, B. (1943). **Mammalian Red Cells as a Source of " Small Particles ".**—*J. exp. Med.* **77.** 315–322. **1083**

S. has isolated " small particles " [see preceding abst.] from equine red blood cells. These particles are very similar to those obtained from other tissues. They were obtained from r.b.c. which did not contain visible granules. The facts that heat in the presence of salt solution had a dispersing effect on previously insoluble structures and that the lipid content of the particles is high, point to disintegrated stroma as the source of these particles. The particles produce haemolysis against homologous r.b.c. when inoculated into rabbits. —D. L. Hughes.

Troitskiĭ, I. A. (1940). Nepreryvnost' i volnoobraznost' zheludochnovo sokootdeleniya u loshadeĭ. **[The Undulating Character of the Gastric Secretion in the Horse].**—*Veterinariya, Moscow.* No. 2. pp. 117–126. [French summary]. **1084**

Experiments were made on three foals, 1½–2 years old, in which gastric fistulae had been made, the animals being left without food and drink for 63, 72, and 85 hours immediately beforehand. One foal in which the stomach had been " isolated " by the method described by Heidenhain was used as a control. It was observed that the gastric secretion was continuous throughout the fasting periods, showing some irregular undulations which did not depend on external factors, particularly conditioned reflexes.

In T.'s opinion, continuous gastric secretion in horses should be regarded as an evolutional adaptation to allow digestion of rough food. The mechanism of continuous and undulating secretion is not known, but it is suggested that it is probably mainly due to neuro-humoral factors.—A. Moldawsky.

Britton, J. W., & Howell, C. E. (1943). **The Physiological and Pathological Significance of the Duration of Gestation in the Mare.**—*J. Amer. vet. med. Ass.* **102.** 427–432. **1085**

An analysis is made of the breeding records of 100 mares covering 407 breeding years. Examination is made of the duration of 172 pregnancies in one stud resulting in foalings in every month of the year. It appears that pregnancies terminating in June-November inclusive tend to be of shorter duration than those terminating in December-May inclusive. For example, 16 pregnancies terminating in August averaged 326 days, 8 terminating in November 335 days, 24 in February 342 days, and 14 in May 337 days.

From the above 172 foaling records and from records from other studs, no confirmation was found for the beliefs that (a) colt foals are carried longer than filly foals and that (b) primipara carry their foals longer than do multipara. Evidence is produced supporting the belief of WILLIAMS that mares conceiving to service on the foal heat tend to carry their foals a few days longer than do those which conceive to service at a later oestrus. In one stud, this difference amounted to an average of three days and in another, eight days. It was noted also that when four or more services were required, pregnancies lasted 4–7 days longer than when 1–3 services were required.

It is concluded that the two most significant factors influencing the length of gestation are (a) the nutritive intake of mares during the latter half of pregnancy, and (b) the existence or otherwise of genital disease.
—J. G. MURRAY.

MARGOLIN, S., BARTLETT, J. W., & LEPARD, O. L. (1943). **The Relation of Longevity to Fertility of Bull Semen.**—*J. Dairy Sci.* **26.** 983–985. **1086**

Data were kept on the longevity of 207 normal semen samples collected from ten bulls over a period of a year; the samples were diluted with egg-yolk phosphate buffer and a portion was placed in a refrigerator at 45°F. to determine its longevity; motility examinations were made at 24-hour intervals until motility ceased. The breeding record for each semen sample was established by routine breeding in an artificial insemination circuit; only semen less than 48 hours old was used for insemination. Analyses of the breeding records kept on the ten bulls and the 306 cows inseminated showed a highly significant correlation between longevity and conception rate of the bull semen. There was only a slight difference in the percentage of conception for fresh (0–24 hours old) semen and one day (24–48 hours) semen, *viz*, 63·7% and 61·9% respectively.
—N. J. SCORGIE.

SALISBURY, G. W., BECK, G. H., CUPPS, P. T., & ELLIOTT, I. (1943). **The Effect of Dilution Rate on the Livability and the Fertility of Bull Spermatozoa used for Artificial Insemination.**—*J. Dairy Sci.* **26.** 1057–1069. **1087**

Bull spermatozoa diluted up to 1 : 32 with egg-yolk citrate showed a decreased ability to maintain motility during storage with each increase in rate of dilution. Semen having greater density and higher initial motility survived storage at the higher dilutions better than did semen of lower density and lower initial motility. In field studies, when the semen was diluted at a predetermined rate according to sperm density, no differences were found in fertility between semen diluted at the rates of one part semen to two parts dilutor (ejaculates containing 600,000 sperm per mm^3) up to one part semen to 14 parts dilutor (ejaculates of 1,800,000–2,000,000 sperm per mm^3). Over 3,900 inseminations were carried out, 1 ml. of diluted semen being placed well into the uterus; the actual volume of undiluted semen varied from 0·2 ml. at the lowest rate of dilution to 0·059 ml. for the highest rate; the average number of sperm per insemination varied from 247–74 millions. No difference was found in fertility for semen diluted at rates up to one part of semen to 16 of dilutor. Semen at all dilution rates was used for as long as 6–8 days after collection. No observable differences were noted in the maintenance of fertility for the several dilution rates during the first four days of storage. For diluted semen used after this period, the number of inseminations was too few for conclusions to be drawn. These results indicate that bull semen of good quality may be diluted at higher rates than generally used without decreasing its effectiveness and that many more cows may be bred from each ejaculate than is now the case.—N. J. SCORGIE.

TRIMBERGER, G. W., & DAVIS, H. P. (1943). **Conception Rate in Dairy Cattle by Artificial Insemination at Various Stages of Estrus.**—*Res. Bull. Neb. agric. Exp. Sta.* No. 129. pp. 14. **1088**

A total of 295 dairy cows and heifers was artificially inseminated at different stages of oestrus to determine the effect of time of service upon conception. The results, expressed as percentages of conception from one insemination in the females bred at various stages of oestrus, were as follows :– start of oestrus 44·0; middle of oestrus 82·5; middle of oestrus and re-bred in 24 hours, 84·0; end of oestrus, 75·0; six hours after oestrus ended 62·5; 12 hours after oestrus ended 32·0; 18 hours after oestrus ended 27·0; 24 hours after oestrus ended, 12·0; 36 hours after oestrus ended, 8·0; 48 hours after oestrus ended, none conceived. During the 35 months of this experiment, 194 females were bred by artificial insemination in the routine (*i.e.* without any set time) breeding of the same herd, and 123 or 63·4% conceived); this group can thus be used as a normal standard for a basis of comparison. The results indicate the best times in oestrus for breeding, and also show that a good conception rate may be obtained when insemination is carried out six hours after the end of oestrus. All the individuals used in the experiment were kept under close observation; 22% in which conception failed to take place did not come into oestrus at the next expected period; rectal examination in a proportion of these cases showed the occurrence of ovulation without oestrus (" silent heat ").—N. J. S.

EVERETT, J. W. (1943). **Further Studies on the Relationship of Progesterone to Ovulation and Luteinization in the Persistent-Estrous Rat.**—*Endocrinology.* **32.** 285–292. **1089**

Long-continued persistent oestrus in a particular strain of rats was interrupted by a single injection of 0·5–1 mg. of progesterone. Vaginal smears became dioestrous within 48 hours, and usually remained so for 2–3 days, during which new follicles were growing. A second injection was given at specific times of this dioestrus or of the following oestrous period; the effectiveness of this treatment in producing corpus luteum formation was slight in early dioestrous, rose to a maximum on the first day of oestrus, and then declined gradually to a negligible value when oestrus had persisted longer than eight days. The evidence tends to support the work of others which has indicated that, in the normal animal, progesterone begins to be secreted in the pre-ovulatory phase of the oestrous cycle.—N. J. SCORGIE.

RILEY, G. M., & HAMMOND, J. C. (1942). **An Androgenic Substance in Feces from Cattle as Demonstrated by Tests on the Chick.**—*Endocrinology.* **31.** 653–658. **1090**

In the course of experiments on chick nutrition, one of the authors observed precocious comb and wattle growth in chicks whose diet was supplemented with either dried faeces from cows or a 60% alcohol extract of this material. A series of three experiments was undertaken to determine (a) the presence or absence of the active factor in the faeces of cattle of different sexes and ages, (b) its source, and (c) its nature. One-day-old Rhode Island Red chicks were used as experimental animals. Urine-free faeces from cattle were collected from four different sources, *viz*, (a) lactating cows on pasture, (b) lactating cows without access to pasture, (c) virgin heifers without access to pasture, and (d) mature bulls having limited access to pasture.

Experiment (1). The effect of the addition of 10% of faeces from sources (a), (c), and (d) respectively was observed. Faeces from source (a) markedly stimulated comb growth, faeces from source (c) did so but not as markedly, and faeces from source (d) failed to show any effect. The testes from chicks fed a diet supplemented with faeces (a) and (c) weighed less than those from chicks fed an unsupplemented diet or a diet supplemented with faeces from source (d).

Experiment (2). Marked comb growth occurred in chicks fed (i) faeces from source (a), (ii) the chloroform extract of faeces, (iii) testosterone acetate, and (iv) testosterone acetate combined with oestrone. It was found that oestrone had no effect on the action of testosterone acetate and that chicks fed (ii) showed markedly less comb growth than chicks fed (i). It was concluded that chloroform had not extracted all the active principle from the faeces.

Experiment (3). This experiment showed that faeces from source (b) when dried for a shorter time at a lower temperature stimulated comb growth to approximately the same degree as did faeces from source (a), although they appeared inactive when subjected to a higher temperature for a longer time. It also showed that a 50% alcohol extract possessed marked comb growth-stimulating activity.

The failure of any of the preparations used to induce gonadal development was considered to eliminate the possibility of the active factor being a gonadotropic substance. The authors conclude that the active factor is an androgenic substance and that it is not derived from the diet of the cattle. It is of especial interest to note that the faeces of bulls seemed to possess no comb growth-stimulating power.—J. G. Murray.

Marvin, H. N., & Meyer, R. K. (1943). **Progonadotropic and Aspecific Effects of the Serum of a Horse Immunized with Extracts of Sheep Pituitary Glands.**—*Endocrinology*. **32.** 271–278. **1091**

A pony mare was injected subcutaneously with an acetone extract of sheep pituitary glands at varying intervals over a period of six months. Its serum from the 34th–95th day after the first injection was found to augment the gonadotropic action of the antigen when injected along with it into normal 21-day-old female rats. From the 107th–183rd day, the mare's serum was found to have an inhibiting action.

The serum was found to inhibit the gonadotropic action of sheep, rat, ox, and human pituitary glands, and of pregnant women's urine and pregnant mares' serum. It failed, however, to inhibit the gonadotropic activity of horse, swine, and fowl pituitary gland extracts. Serum collected during the stage when it possessed augmenting properties had no demonstrable effects on the genitalia of normal immature female rats. Preliminary tests indicated that, using the oxygen consumption of rats as a criterion, the serum contained no anti-thyrotropic substance although the antigen had thyrotropic activity.—J. G. Murray.

Ingalls, T. H., Donaldson, G., & Albright, F. (1943). **The Locus of Action of the Parathyroid Hormone: Experimental Studies with Parathyroid Extract on Normal and Nephrectomized Rats.**—*J. clin. Invest.* **22.** 603–608. **1092**

In order to test the theory that the effect of parathyroid hormone in causing resorption of bone is a result of increased excretion of phosphorus in the urine, parathyroid extract was administered to normal and nephrectomized rats.

Histological and X-ray observations revealed similar resorption in both sets of animals, thus proving that the effect is independent of kidney function. The possibility that resorption in the nephrectomized animals was due to this operation alone and not to the hormone was disproved since, though some qualitatively different resorption due to nephrectomy occurred in 60 hours, there was none in 20 hours unless parathyroid was given.

Further, the possibility that the effect might have been due to the acidity of the extract rather than to the hormone itself was disproved.—Rachel Marshall.

Reineke, E. P., & Turner, C. W. (1942). **Formation in Vitro of Highly Active Thyroproteins, Their Biologic Assay, and Practical Use.**—*Res. Bull. Mo. agric. Exp. Sta.* No. 355. pp. 88. **1093**

This bulletin reviews the literature concerning biological assays of thyroidal substances. The authors have tested the thyroidal potency of iodinated proteins by their effect in stimulating increased oxygen consumption of g. pigs and in decreasing body length of frog tadpoles.

The literature dealing with the iodination of proteins is next reviewed. The authors describe in detail their method for preparing iodinated casein; the factors influencing the potency of the final product are discussed. The thyroidal activity of iodinated casein, soya-bean protein, and egg albumen are compared. Crystalline thyroxine was recovered from a hydrolysate of iodinated casein and its identity established by chemical and physical tests.

Iodinated casein alleviated the symptoms of cretinism in thyroidectomized goats. When fed to cows and goats in declining lactation, artificial thyroproteins have an effect similar to thyroxine in stimulating increased yields of milk and butterfat.—Alfred T. Cowie.

Blaxter, K. L. (1943). **Stimulation of the Milk Production of Dairy Cows by Feeding Thyroid-active Iodinated Proteins.**—*Nature, Lond.* **152.** 751–752. **1094**

A preliminary report is given of the effect of iodinated proteins on the milk production and clinical physiology of the dairy cow in experiments involving 208 animals. Iodinated casein, iodinated whole blood and iodinated ground-nut protein ("Ardein") were all tested. When 50 g. of iodinated "Ardein" was fed, milk production increased by 35%, butterfat production by 54%, this was accompanied by a 30% increase in the resting heart rate and a 34% increase in the resting respiration rate. It was found that the response in milk production to 30 g. iodinated casein was dependent on the initial level of production of the cow. It was not found possible to prolong milk production in cows approaching the end of their normal lactation period by feeding iodinated casein. In the early stages of the work, symptoms of iodism frequently developed, but this was largely overcome when more active iodoproteins were used. Later experiments gave no indication of any impairment of the animals' health. Further experiments are in progress to determine whether practical application of the results are possible.

—Alfred T. Cowie.

See also abstr. **1188** (thyroid gland), **1141-1144** (hormonal therapy), **1076** (gonadotropic hormone).

POISONS AND POISONING

*Andreoni, R. (1942). Azione farmacologica e tossicologica del tallio negli animali di grossa mole. **[Pharmacology and Toxicology of Thallium in Large Animals].**—*Profilassi.* **15.** 49–53. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 456]. **1095**

Oral administration of thallium acetate to horses,

cattle, and sheep caused disturbances of the digestive and nervous systems, characterized by excessive flow of saliva, dysphagia, and depression. In sheep an artificial change of coat was induced, but this did not occur in horses or cattle. After the chemical "shearing", the wool grew longer than after mechanical shearing. The depilatory dose and the toxic dose were almost the same for sheep. The toxic dose in mg. thallium per kg. body weight was 27·33 for horses, 15·67 for cows, 11·71 for calves, 7·81 for fully grown sheep, and 19·5 for lambs. Sex did not affect sensitivity to thallium, but in sheep age was of importance, lambs being less sensitive than adult animals.—A. M. COPPING.

*ENGELS, O. (1942). Ist Handelsdünger Gift für die Tiere? **[Are Chemical Fertilizers Poisonous for Animals?]**—*Z. Schafz.* **31.** 147–148. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 456]. **1096**

In contrast to the views of many gamekeepers and farmers, E. does not consider that artificial manures are likely to be poisonous to wild or domestic animals. The toxicity of most fertilizers is low and poisoning would occur only if large amounts were consumed. This seldom happens in pastures. A case of urea poisoning in deer is recorded when the fertilizer was spread in very dry weather and remained on the surface for a long period. Experimental studies showed that artificial fertilizers were rarely to blame for casualties among stock.—A. M. COPPING.

AST, D. B. (1943). **The Caries-Fluorine Hypothesis and a Suggested Study to Test its Application.**—*Publ. Hlth Rep., Wash.* **58.** 857–879. **1097**

Problems associated with the effect in human beings of the presence and absence of fluorine in drinking water are discussed. The effect of high concentrations of fluorine in causing mottling of the enamel of the teeth is generally accepted, but less well known is the fact that there is considerable evidence to show that high concentrations of fluorine are associated with a low dental caries rate. It is suggested that two districts should be compared as regards the incidence of caries, the drinking water of the one district being normal while fluorine would be added to the drinking water of the other.—RACHEL MARSHALL.

GWATKIN, R., & PLUMMER, P. J. G. (1943). **Toxicity of Red Squill for Swine and Rats.**—*Canad. J. comp. Med.* **7.** 244–249. **1098**

The authors conducted feeding experiments to determine the toxicity of red squill (*Urginea maritima*) for swine and albino rats.

The results indicate that, when red squill is mixed with feed in the proportion of 1 oz. of powdered red squill to 1 lb. of feed, swine refused to eat it, even though hungry, whereas it was readily eaten by albino rats and caused a death rate of 66·6%. When fed to swine, in capsules, in doses of 50, 100, 200, 300, and 400 mg. per kg. body weight, the first two doses did not produce symptoms, but the 200 mg. per kg. dose proved toxic; 300 mg. per kg. and over were lethal.

P.M. findings, both macroscopic and microscopic, in swine and rats are described.—THOS. MOORE.

SEN, B. (1942). **Giant Star Grass.**—*Indian. Fmg.* **3.** 421–424. **1099**

Star grass (*Cynodon plectostachyum*) has been successfully cultivated in a hill station in India. It is a prolific grower. At the early stages of growth the grass may contain up to 0·02% hydrocyanic acid, but the content diminishes with age and the hay contains only traces. Grass from the one-year-old plant has been fed to rabbits, sheep, and bullocks without ill effects. S. tentatively suggests that it should not be fed as a green fodder until the crop is three months old.

[For further information on the toxicity of star grass, see a paper by S. J. VAN DER WALT & D. G. STEYN —(1941). *Onderstepoort J. vet. Sci.* **17.** 191.]

—R. MUKHERJEE.

*CARTA, A. (1942). A proposito della tossicità della "Ferula communis". Nota prelim. **[Toxicity of *Ferula communis*].**—*Nuova Ercol.* **47.** 142–146. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 459]. **1100**

In 1941, CARBONI reported experiments on g. pigs and rabbits indicating that poisoning by *Ferula communis* was associated with disturbances of the nervous system and digestion, particularly haemorrhagic gastro-enteritis, respiratory distress, asthenia and cramp. In the present study, the syndrome of asphyxia was often absent, but haemorrhages with anaemia and prolonged clotting time were common. Inflammatory and degenerative changes in parenchymatous organs were not observed in horses and ruminants. Tests on horses, cattle, pigs, sheep, dogs, rabbits, and g. pigs with alcohol extracts of root, stem, and leaf of *Ferula* indicated that the toxic substance produced a haemorrhagic diathesis.—A. M. COPPING.

SERGENT, ED. (1941). Les cailles empoisonneuses dans la Bible,—et en Algérie de nos jours. Aperçu historique et recherches expérimentales. **[Poisonous Quails in the Bible and in Present-Day Algeria].**—*Arch. Inst. Pasteur Algér.* **19.** 161–192. **1101**

S. quotes many reports, both from classical literature and from recent *verbatim* accounts, of cases of poisoning in human beings following the ingestion of large numbers of quail. Symptoms observed in cases in Algeria were of two kinds, *viz*, gastro-intestinal, with abdominal pain, vomiting, and diarrhoea, and progressive paralysis of the limbs followed by vocal paralysis. They passed off within 36 hours.

Various theories to account for this poisoning are considered, and it is concluded that the most likely cause is toxicity of the flesh as a result of the eating of poisonous plants by the quail, such as certain varieties of hemlock. Experiments showed that quail were unaffected when forcibly fed with considerable quantities of hemlock seed, but dogs fed on these quail developed symptoms of hemlock poisoning similar to those obtained by feeding dogs with the hemlock seed direct, and similar to the symptoms of quail poisoning in human beings described above.—D. G. GILMOUR.

WRIGHT, C. I., & LILLIE, R. D. (1943). **Toxic Effects of Atabrine and Sulfadiazine in Growing Rats.**—*Publ. Hlth Rep., Wash.* **58.** 1242–1250. **1102**

When heavy doses of atebrin near the limit of tolerance were given to rats over a period of two months, the following results were produced :– arrest of growth; lowered food consumption; pigment cell infiltration of intestinal mucosa, lymph nodes, spleen and liver; exudative monocytic pneumonia; focal myocarditis and myositis; often portal thrombi and hepatic infarcts; moderate splenic hemosiderosis, and heavy non-ferrous pigmentation of the epithelium of renal glomeruli and medullary tubules. The effects were much reduced by lessening the dose. Sulphadiazine alone or in combination with atebrin produced a late growth arrest but very little pathologic change. Addition of riboflavin to the diet did not affect the symptoms produced by atebrin.—RACHEL MARSHALL.

JONES, T. L., & KELSO, J. A. (1943). **Can Phenothiazine Become Toxic For Horse after Passage Through Pigs.**—*Canad. J. comp. Med.* **7.** 240–242. **1103**

Four young horses died at different times over a period of 72 hours, after they had eaten straw from a manure pile. The manure originated from a pig pen

in which nine pigs had been given a grain slop containing 160 g. of phenothiazine one week previously. Incoordination and diarrhoea were noted in all the horses, and purple-coloured urine had been voided by one or more animals. The stomach content from the one animal examined gave a presumptive positive test for phenothiazine, while it was negative for other poisons. —L. M. Heath.

THERAPEUTICS AND DISINFECTION

Priselkov, A. M. (1940). O vliyanii morfiya na dykhanie sobak. **[Influence of Morphine on Canine Respiration].**—*Veterinariya, Moscow.* No. 2. pp. 137–143. [French summary]. **1104**

Experiments were performed on seven dogs trained to rest in a particular position and to breathe through a mask. It was observed that large and small doses of morphine reduced the depth of respiration, thus causing diminished ventilation of the lungs. The acceleration of the respiration soon after administration of morphine was not constant and no relation could be observed between the dose and the respiratory movements. The retarded breathing which replaced the primarily accelerated breathing was never more pronounced than during normal sleep.—A. Moldawsky.

I. Castex, M. R., Capdehourat, E. L., & Pedace, E. A. (1941). Inhalación de substancias nebulizadas : Comprobación experimental de su poder de penetración a nivel del aparato respiratorio. **[Inhalation of Nebulized Solutions].**—*Arch. argent. enferm. respir. tuberc.* **9.** 1–11. **1105**

II. Castex, M. R., Capdehourat, E. L., & Lavarello, A. (1941). Técnica de las nebulizaciones y sus principales ventajas terapeuticas. **[Therapy with Nebulized Solutions].**—*Ibid.* 12–28. [Absts. from absts. in *Amer. Rev. Tuberc.* **45.** pp. 61–62 of absts.] **1106**

I. Histological studies on dogs which had inhaled nebulized solutions of substances such as scarlet red, methylene blue, brilliant cresyl blue, colloidal iron, and olive oil showed that the substances penetrated all areas of the lungs. The solutions were rapidly absorbed and the rate of absorption was influenced by the solvent and the size of the drops ; the smaller the drops, the more rapid the absorption and the less the disturbance of the respiratory rhythm.

II. The therapeutic advantages of inhalation of nebulized solutions are discussed and recommendations are given for procedures to be adopted for administering nebulized substances to human patients. It is suggested that the treatment should be useful to reduce the risk of surgical procedures in cases of pulmonary infections. No ill-effects have been noted.—R. Allcroft.

Rammelkamp, C. H., & Keefer, C. S. (1943). **The Absorption, Excretion and Toxicity of Penicillin Administered by Intrathecal Injection.**—*Amer. J. med. Sci.* **205.** 342–350. **1107**

After injection of 10,000 Florey units, penicillin disappeared from the spinal fluid of human patients over periods varying from 24–36 hours. The injections caused a temporary increase of leucocytes in the spinal fluid.—E. Boyland.

Woodruff, H. B., & Foster, J. W. (1943). **Microbiological Aspects of Streptothricin. I. Metabolism and Streptothricin Formation in Stationary and Submerged Cultures of Actinomyces lavendulae.**—*Arch. Biochem.* **2.** 301–315. **1108**

Regular growth and enhanced production of the antibacterial substance, streptothricin, are obtained if submerged cultures of *Actinomyces lavendulae* are grown with forced aeration and agitation. An increase in production of actinomycin also resulted from *A. antibioticus* when grown under similar conditions. Details of the metabolism of the mould are given.—E. Boyland.

Lipmann, F., & Owen, C. R. (1943). **The Antibacterial Effect of Enzymatic Xanthine Oxidation.**—*Science.* **98.** 246–248. **1109**

Milk xanthine oxidase in the presence of a suitable substrate inhibits the growth of *Staphylococcus aureus*. The action is probably due to the formation of hydrogen peroxide in the enzymic oxidation.—E. Boyland.

*Mantovani, C. (1942). Breve nota sperimentale sull'uso solfamidico in medicina veterinaria. **[Sulphonamide Trials in Veterinary Medicine].**—*Azione vet.* **11.** 179–180. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 464]. **1110**

Severe burns and ulcers on the foreleg and shoulder with myositis and fever in a foal yielded to treatment with " streptocil-thiazol " applied locally and given orally. A severe inflammatory condition of the navel region in a cow was also successfully treated by oral and local administration of the streptocil-thiazol.—A. M. C.

*Pirani, A. (1942). Di alcune applicazioni della solfamidoterapia in medicina veterinaria. **[Uses of Sulphonamide Therapy in Veterinary Medicine].**—*Riv. milit. Med. vet., Roma.* **5.** 89–97. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 464. **1111**

The usefulness of the sulphonamide, " streptocil-thiazol ", is reported from many veterinary depots. In 11 horses with swollen submaxillary glands, intravenous and oral administration reduced the inflammation and temperature and improved the general condition. The drug also appeared to prevent development of complications and to shorten the duration of the infection. A case of acute bronchitis in a horse was successfully treated with streptocil-thiazol given by mouth. In complications of wounds such as abscesses, and necrotic or inflammatory conditions, combined local, intravenous and oral therapy was effective in improving the general condition and shortening healing time. —A. M. Copping.

—. (1943). **The Medical Use of Sulphonamides.**—*Med. Res. Coun. War Memo.* No. 10. pp. 46. London : H.M. Stat. Off. [8vo] [9d.] **1112**

This is a very useful review of the pharmacology and clinical uses of the sulphonamide drugs. The most important drugs in general use are described, and the various trade names are given. The pharmacological section discusses the mode of action of these drugs and the significance of some local anaesthetics, as well as *p*-aminobenzoic acid in inhibiting their action. The distribution of the sulphonamides throughout the body is described and there is a useful table of the solubilities in water, serum, and urine. The importance of effective treatment, to prevent the development of resistant forms of bacteria, is stressed.

An account of the blood concentrations needed in various types of infections and the dosage needed to produce such concentrations is given. The treatment of various common conditions is described ; these include streptococcal, meningococcal, pneumococcal, staphylococcal, gonococcal, and other urinary tract infections. The local and systemic use of sulphonamides in the prevention and treatment of infection in wounds and burns and of gas gangrene is included. The use of slowly absorbed compounds, *e.g.* sulphaguanidine, in intestinal infections and the local use of certain com-

pounds, *e.g.* sodium sulphacetamide, in ocular infections is also dealt with.

The toxic reactions are described in some detail and a useful table gives the toxic effects which may be produced by four of the sulphonamides in common use. Two appendixes describe methods for estimating sulphonamides in body fluids, for testing for sulphonamide-resistant organisms, and for sterilizing sulphanilamide powder.—J. M. Robson.

Steyn, D. G. (1942–43). **Sulphonamides—their Comparative Efficacy in Bacterial and other Infections, Relative Toxicity, Dangers and Prophylaxis.**—*J. S. Afr. vet. med. Ass.* **13.** 120–128, and **14.** 31–37. **1113**

A review article which does not lend itself to anything but a summary of the contents. Special attention is paid to sulphanilamide, sulphapyridine, sulphathiazole, sulphaguanidine, and sulphadiazine as these are the most extensively used sulphonamides.

The article is divided into the following sections :– (1) comparative efficacy of sulphonamides in the treatment of bacterial and other infections ; (2) size of therapeutic doses and methods of application ; (3) relative toxicity and dangers of the use of sulphonamides ; (4) treatment of cases of sulphonamide poisoning, and (5) prophylaxis.

Forty-two recent references are listed.—E. M. R.

Free, A. H., Davies, D. F., & Myers, V. C. (1943). **Effect of Sulphanilamide Accompanied by Acid or Alkali upon the Acid-Base Equilibrium of the Dog. Possible Influence of Carbonic Anhydrase.**—*J. biol. Chem.* **147.** 167–173. **1114**

Clinical observations of disturbance of acid-base equilibrium by sulphanilamide therapy have been tested experimentally by observations on dogs. Therapeutic doses of the drug caused no marked change in the acid-base equilibrium of these animals.

The increase in serum pH when sodium citrate is given was prevented by the simultaneous administration of sulphanilamide. Further, the lowering of serum pH when ammonium chloride is given was augmented by sulphanilamide. Though these experiments offer no proof, they can be interpreted as supporting the hypothesis that sulphanilamide inactivates carbonic anhydrase *in vivo*.—Rachel Marshall.

Sbariggi, C. (1938). Inyecciones venosas de aceite mineral, vegetal y animal. **[Effects of Intravenous Injections of Mineral, Vegetable and Animal Oils].**—*An. Fac. Med. vet., Univ. La Plata.* **1.** 157–163. **1115**

It is stated that dogs, cattle, and horses show no ill-effects when oil of sweet almonds, olive oil, cod liver oil, liquid paraffin, castor oil, or camphorated oil is slowly injected intravenously, even in large doses. The total amount administered was given in a series of fractional doses extending over a long period, *e.g.* dogs received up to 57 ml. during a period of 40 days, the maximum dose given at any one time being 10 ml.

Intravenous injection of cod liver oil into the dog causes vomition and bradycardia at first, but the animal gradually acquires tolerance, with increasing doses, and improves in condition as a result of the injections.

It is suggested that these oils form an excellent vehicle for the administration of caustic or non-water-soluble drugs.—Isobel W. Burton.

Steinfield, E., Brylawski, M., & Nash, C. B. (1943). **Sulfathiazole and Staphylococcus Antitoxin in Experimental Staphylococcic Infection.**—*J. Lab. clin. Med.* **28.** 1544–1547. **1116**

Work on the combined action of sulphonamide drugs and antitoxic sera in staphylococcal infections is briefly reviewed.

Mice were injected intravenously with 800×10^6 virulent *Staphylococcus aureus* organisms. Sulphathiazole was given *per os* in doses of 1 g. per kg., 1½, 7½, and 24 hours after inoculation, and then at 24-hour intervals. The dose of serum given contained 166 I.U. per 20 g. mouse. In all, 120 mice were used. The mean survival time of the controls was 6·7 days, whereas in the groups treated with sulphathiazole only and with sulphathiazole and serum the times were 13·0 and 12·7 days respectively. Animals which received serum only died within 6·5 days. The results were statistically significant.

The serum used contained ample amounts of neutralizing bodies for α-exotoxin, a fair amount of β-neutralizing anti-hemolysin, and also antibacterial bodies ; its ineffectiveness is not explained and the authors do not believe that such negative results necessarily invalidate the use of sera in clinical infections.—John Francis.

Anderson, T. (1943). **The Effect of Chemotherapy on the Mortality from Pneumonia in Glasgow.**—*Brit. med. J.* Dec. 18th. 779–780. **1117**

The mortality from 1922–38 was 29·09 per 100 cases of pneumonia notified ; it was 20·51 per 100 from 1939–41, *i.e*, after the introduction of chemotherapy. The difference was less marked at the extremes of age (under one year and over 45) than in the middle age groups. It is emphasized that chemotherapy has had only a moderate effect on the mortality from pneumonia.—J. M. Robson.

Gould, G. N. (1943). **The Control of Mastitis.**—*Vet. Rec.* **55.** 491. **1118**

G. advocates the use of a hypochlorite disinfectant for cows' teats after milking. Leaving teats wet with milk predisposes to infection *via* the teat canal. By cleansing the teats after milking, using a hypochlorite disinfectant, and leaving them as dry as possible, the degree of mastitis control has been improved in several herds.—D. L. Robarts.

Andberg, W. G., & Weirether, F. J. (1943). **The Effect of Chemotherapeutic Agents on the Normal Bovine Mammary Gland : I. The Effect of Novoxil.**—*Amer. J. vet. Res.* **4.** 134–142. **1119**

The authors have studied the action of novoxil in 18 apparently normal quarters of eight cows. Infusions with this drug produced a condition similar to acute mastitis. The glands became enlarged, firm and tender ; the milk became abnormal in consistency. The percentages of milk chlorides and lactose rose and the neutrophile leucocyte counts increased. Five out of six cows on P.M. examination showed numerous small reddish foci in the gland covered with milk clots. Fibrotic nodules also developed.

Novoxil kept for one year at room temperature became unstable and it was difficult to incorporate the silver particles in the oil on shaking.—D. L. Hughes.

Feldman, W. H., & Hinshaw, H. C. (1943). **Promin in Experimental Tuberculosis. Comparative Results of Continuous and of Intermittent Treatment of Tuberculous Guinea Pigs with Sodium p,p′-Diaminodiphenylsulfone-N,N′-Didextrose Sulfonate (Promin).**—*Amer. Rev. Tuberc.* **48.** 256–260. [Spanish summary]. **1120**

In view of the relative toxicity of promin for human patients, the effectiveness of intermittent promin therapy was investigated. Forty-two days after subcutaneous injection with 0·0005 mg. of human tubercle bacilli, a series of 71 g. pigs was divided into three groups : 31 animals served as controls, 20 received promin daily in

the feed throughout the experiment, and 20 received promin daily in the feed on every alternate week. The experiment was terminated 224 days after the injection date, when the last animal of the control group died. All the animals were subjected to P.M. examination, and livers, spleens, lungs, sites of inoculation and contiguous lymph nodes were examined histologically.

The results indicated that both promin-treated groups had impressively less TB. than the untreated controls and that, although drug treatment was most effective in those animals that received continuous treatment, favourable, though less striking, effects occurred in the intermittently treated group. Progressive lesions were found in practically all of the control animals, but in only three of the continuously treated and in only six of the intermittently treated groups.—J. Lochiel McGirr.

*Schreus, H. T. (1941). Vergleich der Wirkung verschiedener Sulfonamidverbindungen auf die Gasbrandinfektion durch Kulturerreger (Welch-Fraenkel, Novy, Pararauschbrand) und die dabei zu beobachtenden Gesichtspunkte. 4. Mitt. [**Comparative Action of Sulphonamides on Gas Gangrene Organisms. IV**].—*Klin. Wschr.* **11.** 1233–1236. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 465. **1121**

Difficulties encountered in infecting experimental animals, especially mice, with organisms producing gas gangrene were due to uneven growth of cultures, diminished virulence, failure of spore formation, or rapid death of the bacteria in artificial media. Various sulphonamide preparations also weakened the virulence of the organisms. Water-soluble preparations such as mesudin [4-amino methyl benzene sulphonamide] or albucid [sulphacetamide] were more effective as they were more readily absorbed. *In vitro*, these compounds destroyed cultures if present in a concentration of 1 : 10,000. *In vivo* the curative dose was 0·1–0·4 g. per kg. body weight and the toxic dose was very little above these amounts. In practical treatment of war wounds, several sulphonamide preparations were effective in preventing infection with gas gangrene organisms.

—A. M. Copping.

Lourie, E. M., & Collier, H. O. J. (1943). **The Therapeutic Action of Penicillin on** *Spirochaeta recurrentis* **and** *Spirillum minus* **in Mice.**—*Ann. trop. Med. Parasit.* **37.** 200–205. **1122**

The results show that penicillin is active against *Spirochaeta recurrentis* and *Spirillum minus* in mice and suggest that it may be considerably more effective than neo-arsphenamine in the treatment of these diseases. The drug had no action against experimental infections in mice with *Trypanosoma rhodesiense*, *T. congolense*, *T. cruzi*, nor against *Plasmodium relictum* in canaries.

—R. Allcroft.

Fulton, J. D., & Yorke, Warrington. (1943). **Studies in Chemotherapy. XXXIV.—Comparison of the Results Obtained by Different Methods of Administration of Drugs in Trypanosomal Infections of Mice.**—*Ann. trop. Med. Parasit.* **37.** 80–95. [For previous parts, see *V. B.* **13.** 376]. **1123**

Adams, A. R. D. (1943). **Studies in Chemotherapy. XXXV.—A Case of Indian Kala-Azar Treated with Propamidine (4 : 4′-Diamidino Diphenoxy Propane).**—*Ibid.* 96–97. **1124**

Fulton, J. D., & Yorke, Warrington. (1943). **Studies in Chemotherapy. XXXVI.—The Therapeutic Action of Various Compounds in Mice Infected with** *Trypanosoma congolense*.—*Ibid.* 152–157. **1125**

XXXIV. A comparison was made of the results of treatment of trypanosome infections in mice with various drugs when administered by the oral, subcutaneous, intravenous, and intraperitoneal routes. Mice experimentally infected with *T. rhodesiense* were treated with novarsenobillon, tryparsamide, reduced tryparsamide thioglycollate, and 4 : 4′-diamidino monomethyl stilbene, and mice infected with *T. congolense* were treated with 4 : 4′-diamidino dimethyl stilbene and with 7 amino-9 (*p*-aminophenyl)-10 methyl phenanthridinium chloride.

The maximum tolerated dose of 4 : 4′-diamidino monomethyl stilbene was highest for the oral and least for the intravenous route and this was found to be generally true for all the compounds examined except novarsenobillon and in part, tryparsamide. The best therapeutic indices were obtained by subcutaneous administration of the drugs, but in the case of tryparsamide and reduced tryparsamide equally high values were obtained for the intravenous and intraperitoneal routes. The results indicate that the superior therapeutic indices obtained by the subcutaneous route are due to the fact that a larger dose of the drug is tolerated when given by this route than by the intraperitoneal or intravenous routes, but the minimum effective dose and minimum curative dose were approximately the same whichever of the three routes was employed. It is pointed out that drugs are readily administered subcutaneously but, except in the case of tryparsamide, all the present series caused bald patches or ulcers at the site of inoculation; healing was subsequently complete in each case.

In the treatment of *T. rhodesiense* infections, the highest therapeutic indices were obtained when 4 : 4′-diamidino monomethyl stilbene was given subcutaneously while in the case of *T. congolense* infections, the phenanthridinium compound when given subcutaneously was at least as active curatively as 4 : 4′-diamidino dimethyl stilbene; the curative index for the latter drug when given by the intraperitoneal route was superior to that for the phenanthridinium compound.

The results of this investigation indicate that, in the case of reduced tryparsamide at least, the trypanocidal effect of a relatively high concentration of drug in the blood for a short period is about the same as that for a relatively low concentration over a longer period.

XXXV. A case of Indian kala-azar is reported which was apparently cured by the intramuscular injection of propamidine (4 : 4′-diamidino diphenoxy propane). [See also *V. B.* **11.** 639.]

XXXVI. In a comparison of the effectiveness of various compounds of widely different constitution in mice infected with *T. congolense*, 7 amino-9 (*p*-aminophenyl)-10 methyl phenanthridinium chloride and 4 : 4′-diamidino dimethyl stilbene were found to be the two most active substances. Among the other substances tested, including 4 : 4′-diamidino stilbene, 4 : 4′-diamidino monomethyl stilbene, tartar emetic, surfen and surfen C, tartar emetic was not very efficient in promoting cures while surfen and surfen C had no curative action under the conditions employed. Other related phenanthridine compounds were also tested but were found to be inactive. The results of tests with antimony compounds showed that stabilized fouadin and neostam were curative in maximal doses, stibosan failed to bring about any cure, and one cure was obtained with stibenyl. Plasmoquine, atebrin, and halarsol were also tested and found to be devoid of action while Bayer 205 had only a slight action in maximum tolerated doses.

—R. Allcroft.

Carmichael, J., & Bell, F. R. (1943). **A Preliminary Study of 4 : 4′-Diamidino Dimethyl Stilbene in the Treatment of** *Trypanosoma congolense* **in Cattle.**—*Ann. trop. Med. Parasit.* **37.** 145–146. **1126**

In these trials, a freshly prepared solution of

4 : 4′-diamidino dimethyl stilbene was administered in a single dose of a 5% solution. Results show that in cattle intravenous doses of 2·5 mg. per kg. body weight (four cases) and 5·0 mg. per kg. (two cases) cleared the peripheral blood for 10–12 days, but all cases relapsed. Of six animals which received 10·0 mg. per kg. intravenously, four were cured, one died, and one relapsed after 20 days; two animals which received the same dose intramuscularly relapsed after 15 and 18 days. Of four animals which were given 12·5 mg. per kg. intravenously, two were cured and two were poisoned; two other animals were cured which received this dose intramuscularly. In all cases, whether toxic or not, marked salivation occurred after administration of the drug, together with protrusion and curling of the tongue. Death occurred within a few minutes of the injection in all cases of poisoning except in one case which died 1½ hours after receiving the drug. The most marked effects were on the respiratory system; the respiratory rate was greatly increased at first, but the animals soon passed into a state of extreme dyspnoea, with forced inspirations, dilated nostrils and open mouth.

Later observations on the cured animals indicate that 4 : 4′-diamidino dimethyl stilbene is unlikely to produce delayed poisoning as was shown to be the case with pentamidine.—R. Allcroft.

Kornetov, N. I., & Mirzoyan, N. A. (1942). O lechenii vistseral'novo leĭshmanioza solyusur'minom. (Predvaritel'noe soobshchenie). **[Treatment of Visceral Leishmaniasis with Solusurmin. Preliminary Communication].**—*Med. Parazitol., Moscow.* **11.** No. 6. 88–92. **1126a**

Solusurmin, a Soviet preparation similar to solustibosan, is less toxic than the latter. It does not decompose in solution and it may be applied intramuscularly. In spite of the fact that for a complete course of treatment more injections are required than with neostibosan, the treatment period may be shortened as solusurmin can be injected daily. 2·5 ml. of 2% solution of solusurmin per kg. body weight was well tolerated by experimental dogs.

Details are given of a few human cases treated, it is considered, with useful results.—A. Moldawsky.

Hawkins, P. A., Cole, C. L., & Thorp, F., Jr. (1943). **The Effects of Sulfaguanidine and Sulfasuxidine in a Natural Outbreak of Ovine Coccidiosis.**—*Vet. Med.* **38.** 337–339. **1127**

The experiments described in this paper show that in the few animals considered, both sulphaguanidine and sulphasuxidine (succinyl sulphathiazole) are of some value in the control of natural outbreaks of coccidiosis. They inhibit the production of oocysts by ovine coccidia, and are of some benefit in reducing clinical symptoms of ovine coccidiosis, provided that treatment is started early. The method adopted consisted in the case of sulphaguanidine of feeding in the grain ration 0·1 g. per kg. body weight each day. Sulphasuxidine was used as a drench at the rate of 1 g. per day.

—C. Horton Smith.

Acosta, L. (1943). Cuatro casos curados de anaplasmosis bovina con arsenosan. **[Treatment of Four Cases of Bovine Anaplasmosis with Arsenosan].**—*Rev. Med. vet., B. Aires.* **24.** 177–180. **1128**

Intravenous injection of arsenosan, in one case in three doses of 0·18 g., and in the other three cases in two doses of 0·6 g., at 48-hour intervals, resulted in complete disappearance of the parasite, rapid increase of appetite and improvement in general condition.

—J. G. Carr.

Steyn, H. P. (1942). **A Report on the Failure of Acaprin to Cure *Babesia bigemina* Infection in Bovines.**—*J. S. Afr. vet. med. Ass.* **13.** 113–115. **1129**

It has usually been accepted that a single dose of acaprin cures cases of redwater in cattle. Four cases are now recorded of the failure of acaprin to cure this infection. In one of these cases, death resulted in spite of subsequent inoculation with gonacrine and piroblue. Two of the other cases, in which relapse occurred after the initial treatment, were successfully treated with piroblue and gonacrine respectively. S. suggests that the failure of acaprin to cure the cows may have been due to the fact that they were all highly susceptible and in full lactation. Heavy tick infestation was noted and there may have been some degree of anaemia due to faulty nutrition.—E. M. Robinson.

Rampon, L. (1941). Emploi de la gonacrine dans le traitement de la babésiellose bovine à Babesiella berbera. **[Use of Gonacrine in the Treatment of *Babesia argentina* Infection in Cattle].**—*Arch. Inst. Pasteur Algér.* **19.** 308–312. **1130**

Twenty-four observations are recorded on the treatment of cattle infected with *B. argentina* by the intravenous injection of gonacrine [acriflavine]. It is concluded that a dose of 1 g. per head is satisfactory if the blood infestation is light, but if the parasites are numerous such a dose may cause collapse and death. For heavy infections, four doses of 0·5 g. gonacrine given at intervals of 24 hours gave satisfactory results.

—U. F. Richardson.

Babcock, O. G., & Boughton, I. B. (1943). **Sulfur-Feeding Tests for the Control of Ectoparasites of Animals.**—*J. Amer. vet. med. Ass.* **103.** 209–212. **1131**

Preliminary trials on five Angora goats showed that feeding them with amounts of sulphur (325 mesh) varying from 4·43–151·76 g. per day for periods up to 54 days, did not reduce their louse infestation. Controlled experiments were then made using 12 goats and three calves, the amount of sulphur fed daily being 5 g. per 100 lb. live weight over a period of 257 days. This feeding had no apparent effect on the louse population of the animals nor did it affect the numbers of the spinose ear tick (*Ornithodoros megnini*) with which one of the treated animals became infested.—J. B. Cragg.

Creighton, J. T., Dekle, G. W., & Russell, J. (1943). **The Use of Sulfur and Sulfur Compounds in the Control of Poultry Lice.**—*J. econ. Ent.* **36.** 413–419. **1132**

The direct feeding of sulphur was found to be ineffective for the control of chicken lice, while the incorporation of sulphur in a balanced mash gave limited control. Dusting the fowls with sulphur at intervals gave excellent control, but the best results were obtained by dipping the birds in a wettable sulphur or a lime-sulphur bath.—W. Moore.

Parish, H. E. (1943). **Sodium Fluosilicate to Control Poultry Lice.**—*J. econ. Ent.* **36.** 353–354. **1133**

A dip containing ½ oz. sodium fluosilicate (98% pure) to a gallon of water gave 100% control of chicken lice, and proved an efficient substitute in this respect for sodium fluoride.—W. Moore.

Matthysse, J. G., & Schwardt, H. H. (1943). **Substitutes for Rotenone in Cattle Louse Control.**—*J. econ. Ent.* **36.** 718–720. **1134**

A satisfactory substitute for derris dust in the control of the four species of cattle lice, consists of a mixture of one part finely ground sabadilla seed to ten parts wettable sulphur. Ground yam bean seed one part, to ten parts wettable sulphur, is also very efficient. Dusts containing thanite, lethane, nicotine, hellebore, and pyrethrum are unsatisfactory.—W. Moore.

SMITH, L. E., & MELVIN, R. (1943). **The Toxicity of Some Heterocyclic Compounds to Young Screwworms.**—*J. econ. Ent.* **36.** 475–476. **1135**

In tests of three dibenzo derivatives of five-membered heterocyclic compounds against larvae of *Cochliomyia americana*, there appeared to be no relationship between their physical properties and their toxicity. Compounds containing one sulphur atom in the heterocyclic ring were toxic, but the one containing two was non-toxic. The introduction of two imino groups produced the most toxic compound included in the study, dihydrophenazine, with a minimum lethal concentration of 0·01–0·025%.—W. MOORE.

LACROIX, J. V., & MAYER, K. (1943). **Lethane 60 in the Control of the Brown Dog Tick.**—*N. Amer. Vet.* **24.** 678 & 680. **1136**

A mixture of 7 parts lethane 60, 4 parts emulsifier B—1956, and 5 parts pine oil, with water to make 100 parts, applied in a bath, gave good control of *Rhipicephalus sanguineus* attached to dog hosts. From limited observations made, lethane 60 appeared to be fatal to kittens, so that it should not be used on cats for any purpose.—W. MOORE.

GOODEN, E. L. (1943). **Density and Particle Size of Derris and Cube Powders.**—*J. econ. Ent.* **36.** 632–633. **1137**

The density of both derris and cube powders in commercial powdered form is 1·4 g. per c.c. By using this density, G. calculated the surface mean diameter to be approximately 6μ and not 15μ as calculated in previous determinations.—W. MOORE.

TURNER, N. (1943). **Reversals in Order of Effectiveness of Insecticides.**—*J. econ. Ent.* **36.** 725–728. **1138**

In comparative tests of insecticides, using a dual-fixed nicotine dust and a derris dust at different dosages, the dosage response curves are found to cross at approximately 0·7% rotenone and 3% nicotine. Below these concentrations, derris was more effective, above them nicotine. Variations in results reported by other workers may be due to differences in the tenacities of the materials. In these tests derris dust was much more tenacious than the nicotine preparation.—W. MOORE.

WADLEY, F. M., & SULLIVAN, W. N. (1943). **A Study of the Dosage-Mortality Curve.**—*J. econ. Ent.* **36.** 367–372. **1139**

In a mathematical study of the concentration-mortality relation, in which adult houseflies and pyrethrum sprays were used, the curves obtained indicated strongly a definite threshold of toxic concentration. The numbers of insects used were considered insufficient for checking the significance of 100% mortality at the highest concentration used. When spray concentrations were transformed to logarithms, and percentages of mortality to probits, the data indicated significant and definite curvature, and it is concluded that further study of the curve is justified.—W. MOORE.

—. (1943). **Newer Methods in the Use of Phenothiazine.**—*N. Amer. Vet.* **24.** 147–152. **1140**

The use of phenothiazine for the control of parasitism in domestic animals is reviewed in this article. It is pointed out that the best time to treat animals is just before they are put on to pasture in the spring. This removal of residual infestations from the animals has the additional advantage of preventing reinfestation of pastures, and is especially valuable when these have been rendered free from parasitic larvae by the winter climate.

For sheep, phenothiazine has proved to be a very efficient anthelmintic, removing over 80% of stomach worms, nodular worms, and hookworms when given in 25 g. doses. The drug may be administered as a drench, in capsule, as a bolus, or mixed with the food, and more recently it has been administered with salt as a lick. Subtherapeutic doses, given with a salt lick, are effective in preventing the development of larvae in the faeces, thus reducing pasture infestation, although there is no effect on the parasitic infestation of the sheep.

In goats, stomach worm infestation can be treated effectively by 25 g. doses of phenothiazine.

The premature widespread application of phenothiazine as an anthelmintic for horses was followed by disastrous results, but effective and safe methods of administration have now been worked out. It is effective against strongyles and *Trichostrongylus axei*, but its action against other parasites of the horse is doubtful. The dosage for a 1,000-lb. horse is 20–30 g., which may be divided and administered as a daily dose of 1–5 g. in the case of brood mares and other horses (anaemic and emaciated animals) which cannot safely be given a single large dose. Toxic effects which have been described include constipation, anaemia, and kidney damage.

In cattle, phenothiazine is effective in the treatment of stomach worms, 50–80 g. doses having been found to be 80–100% efficient in a trial with six calves. The drug is administered as a drench or bolus or in capsules after 18–24 hours' fasting.

In swine, reports show phenothiazine to be 92% effective in removing nodular worms and 51% effective (*i.e.* as effective as oil of chenopodium) in removing heavy *Ascaris* infections. Stomach worms, thorny-headed worms, and kidney worms were not affected although phenothiazine did inhibit the development of kidney worm larvae in the faeces.

It has been reported that 0·5 g. of phenothiazine administered to chickens over four consecutive days removed 99% of mature or almost mature *Heterakis gallinae*. There were no undesirable effects on egg production nor on weight.—T. E. GIBSON.

I. MACKENZIE, C. G., & MACKENZIE, J. B. (1943). **Effect of Sulfonamides and Thioureas on the Thyroid Gland and Basal Metabolism.**—*Endocrinology.* **32.** 185–209. **1141**

II. ASTWOOD, E. B., SULLIVAN, J., BISSELL, A., & TYSLOWITZ, R. (1943). **Action of Certain Sulfonamides and of Thiourea upon the Function of the Thyroid Gland of the Rat.**—*Ibid.* 210–225. **1142**

III. WILLIAMS, R. H., & BISSELL, G. W. (1943). **Thiouracil in the Treatment of Thyrotoxicosis.**—*Science.* **98.** 156–158. **1143**

I. Feeding sulphaguanidine to immature rats at a dietary level of 0·5–3·0% produced hyperaemia and enlargement of the thyroid gland, characterized histologically by an increase in the height of the follicular epithelium with a concurrent decrease in the amount of colloid. The thyroid weight at the end of two weeks was proportional to the dietary level of sulphaguanidine. In some limited experiments, similar effects were produced in mice and dogs but not in chicks or g. pigs. Although the rate of the thyroid weight increase in rats fed a given level of sulphaguanidine decreased with age, the amount of histological change was only slightly less in the older rats. It was considered that this age difference was not entirely accounted for by a decreased blood level of the drug.

No constant effects on basal metabolic rate were encountered in immature rats, but in mature male rats the B.M.R. was rapidly reduced by feeding 2% of sulphaguanidine. This effect in rats on a stock diet was not prevented by a large number of dietary factors, including *p*-aminobenzoic acid, vitamin C, and liver,

nor by iodine. Thyroxin, however, at a dose of 1 μg. per 10 g. body weight entirely prevented the effect.

Feeding sulphaguanidine also resulted in histological changes in the anterior pituitary, closely similar to those following thyroidectomy. Moreover, hypophysectomy prevented the thyroid alteration resulting from the feeding of sulphaguanidine. From these results, it was concluded that the thyroid-enlarging effect of sulphaguanidine is probably mediated through the anterior pituitary.

Several other sulphonamides were tested for their effect on thyroid weight in young rats. Sulphapyridine and sulphadiazine were as effective as sulphaguanidine, but sulphanilamide was considerably less effective. Thiourea and certain substituted thioureas produced the effect at considerably lower dosage levels than were necessary for the sulphonamides.

II. These authors independently obtained most of the results referred to in I, and, with regard to certain of the effects, obtained more detailed results. Thus they were able to show that the state of hypothyroidism produced by administration of certain sulphonamides and thiourea led to decreased food intake and decreased growth and development, as well as to lowered basal oxygen consumption. Moreover, they found that the histological condition of the gland rapidly reverted to normal when administration of the drug was stopped. By means of tests in which graded doses of the several drugs were given, the drugs were placed in the following order of potency as regards their effect in producing thyroid enlargement and histological change :– thiourea and sulphadiazine about equal, then sulphapyridine, sulphathiazole, sulphaguanidine, sulphanilylurea, sulphanilamide, and succinylsulphathiazole. It is concluded that the effect is produced by the inhibition of production of thyroid hormone.

III. Tests by Astwood [*V. B.* **14.** 33.] showed that thiouracil was the most effective of a large group of sulphonamides and thioureas in inhibiting the production of thyroid hormone, and in this paper the authors give a preliminary report of results obtained in the treatment of thyrotoxicosis in human beings with this drug. In all the nine cases the clinical evidence of thyrotoxicity had disappeared and the B.M.R. had reached normal levels from 3–7 weeks after the beginning of treatment. It is emphasized that further work must be done on the optimum dosage, absorption rate, and toxicity of this drug before its full value can be assessed. —D. G. Gilmour.

*Bellomo, G. (1942). Sull'ormone del corpo luteo e sua applicazione nella terapia delle bovine ninfomani. [**Corpus Luteum Hormone in the Treatment of Bovine Nymphomania**].—*Riv. milit. Med. vet., Roma.* **5.** 83–88. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 485]. **1144**

Injection of 150–200 mg. of corpus luteum hormone as " proluton " was effective as treatment in five cases of nymphomania due to ovarian cysts.—A. M. Copping.

Holder, H. G., & Mackay, E. M. (1943). **Carbamide-Sulfonamide Mixtures in Wound Therapy.**—*Surgery.* **13.** 677–682. **1145**

Mixtures of carbamide (urea) with sulphanilamide and sulphathiazole have been used in the treatment of various types of wounds. It is claimed that urea removes the source of all, and directly antagonizes at least some, sulphonamide inhibitors and that it increases the solubility of the sulphonamides. The results of the combined treatment are said to be excellent, although no details are given.—J. M. Robson.

Robson, J. M. (1943). **Control of Sepsis.**—*Edinb. med. J.* **50.** 399–414. **1146**

The use of chemical substances in the treatment of sepsis is reviewed. Such substances may act (1) by direct toxic effect upon bacteria, (2) by bacteriostatic action, or (3) by reduction of virulence. Methods of administration are (a) general, orally or by injection ; (b) local, in the form of solutions or suspensions, as powders, ointments, etc. Strains of bacteria may be found to be drug resistant or may develop drug resistance, and also drug sensitivity in the patient may occur. Both conditions may be countered by limiting the duration of treatment or by changing to treatment with another drug.

Immediate disinfection of a wound may be accomplished by detergents and acridine derivatives after which, if the wound is not closed, a bacteriostatic agent should be applied to prevent reinfection.

After the lapse of several hours, preferably within 12 hours, though complete sterilization cannot be achieved, delayed disinfection may be accomplished by the use of suitable bacteriostatic agents (sulphonamides, penicillin) which allow the natural defences of the body to function.

Treatment of established sepsis may be accomplished by the use of proflavine powder, penicillin, propamidine, and sulphonamides. Particularly in the case of the sulphonamides is it necessary previously to remove pus. Chlorine-releasing agents (hypochlorite) may have no specific disinfectant action, but they promote removal of pus and dead cells.—Rachel Marshall.

Macfarlane, R. G. (1943). **Human Fibrin as a Dressing for Burns.**—*Brit. med. J.* Oct. 30th. 541–543. **1147**

The method is described of preparing from human plasma adhesive fibrin membranes suitable for covering burnt areas. It is comparatively simple as is the technique of using them. The results obtained are not appreciably better than those given by certain other applications. In cases that became infected the membranes were rapidly lysed. In favourable cases the membrane dried into a scab and healing proceeded beneath this ; healing was not more rapid than was the case in other areas treated differently (*e.g.* with sulphanilamide cream).—J. M. Robson.

MacNeal, W. J., & Farnsworth, N. C. (1943). **The Evaluation of Antiseptics and Other Anti-Infectious Agents.**—*J. Lab. clin. Med.* **28.** 963–971. **1148**

Anti-infectious agents are classified into three groups :– (1) disinfectants, which are employed at a distance from the possible bacterial host, such as substances used for treating sewage ; (2) antiseptics, which are applied locally to the body surface or to a wound ; (3) anti-microbic substances which are active in the blood after absorption : in this group are the sulphonamides.

Evaluation of the efficacy of agents in the second group can be most reliably made by treatment of experimental wounds, but considerable skill is required ; evaluation by means of *in vitro* tests on particular organisms may be misleading, since their effect upon other organisms may be different and the *in vitro* effect may be different from *in vivo*.

Evaluation of agents in group (3) can be made by administration of the substance under test to infected animals or by a number of *in vitro* methods.

In both cases (2) and (3), the use of *in vitro* methods only may fail to reveal toxicity of the agents towards particular organs or tissues which are not concerned in the test.

The conclusion is drawn that all possible methods of evaluation should be employed together.—R. M.

ARNOLD, R. B., & GARRETT, O. F. (1943). **Bactericidal Action of Radiant Energy from Special Types of Lamps on Organisms Found on Dairy Utensils and Equipment.**—*J. Dairy Sci.* **26.** 309–320. **1149**

The authors studied the bactericidal action of the radiant energy given off by two lamps emitting radiations centred round the wavelength of 2,537 Å. The organisms were killed off in logarithmic order only after the early period of exposure had passed. The bactericidal rate decreased as the distance between the organisms and the lamp increased. The angle of incidence of the radiant energy to the exposed surface did not materially affect the results until it was over 50°. Films of water over the exposed organisms did not decrease the bactericidal rate, but films of milk or agar reduced the effect of the radiant energy. Unclean, cracked, and shaded surfaces were not readily sterilized. Organisms growing on the surface of dairy utensils were completely destroyed or greatly reduced in number in a short time by the lamps employed.—D. L. HUGHES.

See also abst. **1043** (sheep dips).

HYGIENE AND PUBLIC HEALTH

OGONUKI, H., & IDE, M. (1942). **Outbreaks of Food Poisoning in Japan.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5.** 423–427. **1150**

In Japan, most cases of food poisoning in man are due to contamination of fish and vegetables. Food poisoning due to duck eggs is important in Formosa. *Salmonella enteritidis* and *S. typhi-murium* in cattle with enteritis, *S. cholerae-suis* in cases of swine fever, *S. enteritidis* in a case of pig paratyphoid, and *S. derby* in the gall bladder of a pig, are the only naturally occurring salmonella infections reported in animals in Japan. No outbreaks of poisoning due to meat of emergency slaughtered animals have been reported.

—D. D. OGILVIE.

TECHNIQUE AND APPARATUS

PLOSKIREV, N. V. (1942). Sukhie elektivnye sredy. **[A Dry Selective Medium].**—*Zh. Mikrobiol., Moscow.* No. 10. pp. 37–40. **1151**

P. discusses concentrated solid media.

—A. MOLDAWSKY.

BAGLIKOVA, V. G. (1942). O sukhom diagnostikume. **[Dry Diagnostic Medium].**—*Zh. Mikrobiol., Moscow.* No. 10. pp. 36–37. **1152**

This is a preliminary communication. A suspension containing 80–100 milliards per ml. of *Proteus vulgaris* X_{19} distributed and dried upon cellophane paper in drops of 0·1 ml. and subsequently diluted in 1 ml. saline solution provided a suitable standard suspension for the agglutination test, and preserved its activity after three months.

Similar dried suspensions from the typhoid-paratyphoid group of organisms were useless for the Widal test.—A. MOLDAWSKY.

HAJNA, A. A., & PERRY, C. A. (1943). **Comparative Study of Presumptive and Confirmative Media for Bacteria of the Coliform Group and for Fecal Streptococci.**—*Amer. J. publ. Hlth.* **33.** 550–556. **1153**

Brilliant-green lactose bile broth is recommended as a confirmatory secondary medium for coliform organisms. Buffered lactose broth incubated at 45·5°C. is also recommended. The authors claim that a buffered bile-salt lactose broth inhibits the majority of faecal streptococci, allowing the full growth of coliform organism, even at 45·5°C. and that this may be used as a primary or secondary medium. A new medium is described for the isolation of faecal streptococci. It is a buffered glucose broth containing 0·05% sodium azide. Into it may be inoculated water, milk, or sewage for incubation at 45·5°C.—D. L. ROBARTS.

—. (1942). Metod polucheniya peptona dlya bakteriologicheskikh tseleĭ. **[A Method of Peptone Preparation for Bacteriological Purposes].**—*Zh. Mikrobiol., Moscow.* No. 10. pp. 34–36. **1154**

Two peptone media were prepared by the addition of hydrochloric acid or phosphoric acid to erythrocytes and minced meat. The preparation and testing of the media are described in detail.—A. MOLDAWSKY.

ZHITOMIRSKIĬ, V. K. (1942). Krakhmal kak zamenitel' agara v vaktsinnom proizvodstve. **[The Use of Starch as a Substitute for Agar in Vaccine Production].**—*Zh. Mikrobiol., Moscow.* No. 10. pp. 26–29. **1155**

A mixture containing 15% potato starch and 0·5% archangel agar was found to be a suitable base for solid nutrient media in vaccine production. The medium is more economical than agar medium, is well buffered and less viscous. The biochemical and antigenic characters of dysentery bacilli grown on this medium were not influenced.

The medium is not suitable for cultivating bacteria for diagnostic purposes, owing to the high buffer action of the starch.—A. MOLDAWSKY.

SUKHATME, P. V., & PANSE, V. G. (1943). **Size of Experiments for Testing Sera or Vaccines.**—*Indian J. vet. Sci.* **13.** 75–82. **1156**

The authors deal with the principles involved in determining the number of test animals to be used before it may be concluded statistically that a particular serum or vaccine is efficacious to the extent of reducing the normal rate of infection by any required percentage. A table is given to show the minimum number of pairs of animals to be used in such experiments in relation to the normal rate of infection and to the desired margin of difference between the values of the current and the experimental method of treatment.—S. SEN.

RAYNER, A. G. (1943). **A Simple Method for the Preservation of Cultures and Sera by Drying.**—*J. Path. Bact.* **55.** 373–375. **1157**

A method is described of drying cultures and sera from the frozen state by placing them in small quantities on discs of sterile cellophane in Petri dishes. Such material rapidly freezes in a vacuum desiccator and can then be dried and sealed off in vacuum tubes.

—R. S. DE ROPP.

*HAMPERL, H. (1941). Ueber gute Erfahrungen mit der Hallbergschen Färbemethode für Tuberkelbakterien. **[Good Results with Hallberg's Staining Method for Tubercle Bacilli].**—*Münch. med. Wschr.* p. 718. [Abst. from abst. in *Z. Fleisch- u. Milchhyg.* **51.** 274]. **1158**

When stained by Hallberg's method, tubercle bacilli appear very dark blue and somewhat thicker than when the Ziehl-Neelsen method is employed. A stock solution of stain is made up containing 5 g. Nachtblau (Grübler) and 100 ml. of 95% alcohol. The solution used for staining is made from this and has the following composition : Nachtblau stock solution 10 ml., distilled water 100 ml., 10% caustic potash 0·2 ml., and phenol

liquifactum 2·5 ml. The method employed is as follows :– cover an air-dried smear with staining solution and bring to the boil over a flame ; cool for 5 min., differentiate in hydrochloric acid alcohol, and finally counterstain with neutral red or pyronin.
—T. E. GIBSON.

WEISS, E. (1942). **A New Method of Staining Tubercle Bacilli.**—*Amer. Rev. Tuberc.* **46.** 199–204. [Spanish summary]. **1159**

W. describes a new method of staining tubercle bacilli, the value being based on tests on the examination of smears prepared from pooled sputum samples, from cultures of human and bovine tubercle and from various other organisms,and stained by various dyes, as compared with the examination of similar material stained by the Ziehl-Neelsen method. The procedure consists of staining with an alcoholic solution of safranin or pyronin after treating with a mordant of 1 part of alcoholic solution of tannic acid to 2 parts of acetic acid in formaldehyde. Decolorization is effected with 15% glacial acetic acid in acetone and Loeffler's methylene blue is used as counterstain. The advantages claimed are that the solutions used are more stable than those used in the Zeihl-Neelsen technique and that the decolorizing agent employed simultaneously swells the bacteria, thus facilitating their recognition.—H. I. FIELD.

HOLM, J., & LESTER, V. (1942). **Diagnostic Demonstration of Tubercle Bacilli. Comparison between Cultivation and Inoculation of Guinea-Pigs.**—*Acta tuberc. scand.* **16.** 310–329. [In English]. **1160**

For the examination of specimens containing no solid, tough, or very slimy elements, " acid homogenization " was used. The sample was centrifuged for 15 min. and then 2 ml. of the deposit were mixed with 2 ml. 6% H_2SO_4. After vigorous shaking, the sample was left standing for 10 min., after which the tube was filled with distilled water and centrifuged. The deposit was sown out with a Pasteur pipette without neutralization. Fairly solid or very slimy specimens were treated by " alkali homogenization ". Amounts of 1–2 ml. were placed in a centrifuge tube [size not stated] which was then filled two-thirds full with 4% KOH. The tube was vigorously shaken and incubated for 20 min. at 37°C. After centrifuging, the sediment was neutralized with 1–2 drops 2N HCl. Material for g. pig inoculation was not homogenized unless it was believed to be seriously contaminated. Only one g. pig was inoculated from each sample. The g. pig test was relatively more sensitive when non-homogenized material was used.

On examination of 20,090 specimens with simultaneous employment of both methods, the presence of tubercle bacilli was demonstrated in 3,731 specimens. The work showed that on the whole, cultivation is a considerably more sensitive method for demonstration of tubercle bacilli than is inoculation of g. pigs. While cultivation failed in altogether 323 cases (8·6%), inoculation of g. pigs failed in altogether 829 cases (22·2%).

As was to be expected, g. pig inoculation proved relatively more serviceable for the demonstration of bovine tubercle bacilli. In this respect, g. pig inoculation failed in 56 cases (12·2%), while cultivation failed in 76 cases (16·6%). There was also a difference in the sensitivity of the two methods with the various kinds of specimens.—JOHN FRANCIS.

DEVOLT, H. M. (1943). **A New Medium for the Cultivation of *Histomonas meleagridis*.**—*J. Parasit.* **29.** 353–355. **1161**

Media used by other workers for the cultivation of *H. meleagridis* necessitated the addition of sterile supplements and the complete medium was never submitted to autoclave sterilization. The egg slants which were used fragmented as a result of bacterial action. Observation indicated that these slants played no part in sustaining the protozoa and they were therefore dispensed with in the new medium now described. The formula used is as follows : NaCl 9·0 g., $CaCl_2$ 0·2 g., KCl 0·4 g., $NaHCO_3$ 0·2 g., glucose 2·0 g., fresh turkey serum 20·0 ml., N/20 NaOH 20 ml., distilled water 1,000 ml. The medium is prepared by adding to Locke's solution 2% of fresh turkey serum. Chicken serum also appeared to be quite suitable. Addition of N/20 NaOH adjusts the pH to approximately 9·0 and prevents precipitation of serum protein when the medium is heated in the autoclave at 120°C. for 20 min. Should the inoculated cultures grow bacteria at the expense of the protozoa, it is suggested that medium without glucose should be used and the concentration of serum reduced to 1%. Cultures of *Histomonas* have been grown in the medium for several periods of a year or more, transfers being usually made twice a week. The advantages of this medium are that transfers need not be made at such frequent intervals, sterilization is largely *en masse*, and preservation is easy.—C. HORTON SMITH.

LILLIE, R. D. (1943). **A Giemsa Stain of Quite Constant Composition and Performance, Made in the Laboratory From Eosin and Methylene Blue.**—*Publ. Hlth Rep., Wash.* **58.** 449–452. **1162**

If methylene blue polychromed by an alkali process is employed as a source of azures, a mixed product is obtained, since alkali polychroming engenders simultaneously a wide variety of decomposition products of methylene blue. The acid oxidation process produced polychrome methylene blues of constant spectroscopic characteristics when the same ratio of potassium bichromate was used, but trials showed that fresh variation occurred when attempts were made to salt out and recrystallize from alcohol. Finally it was found that prompt cooling of the acid solution after completion of oxidation, followed by neutralization with the exact precalculated amount of sodium bicarbonate at 10°–15°C., immediate precipitation with eosin, and prompt filtration gave a standard product with only 2–3 mμ variation in its absorption maximum and median of the absorption band. Details are given as to the making of azure B. eosinate, azure A. eosinate and methylene blue eosinate, and the procedure to be adopted in mixing and dissolving these eosinates in order to obtain a satisfactory Giemsa stain.—U. F. RICHARDSON.

TRAINER, M. T. (1943). **Factors which Interfere with Benzidine and Meyer's Tests for Blood in Milk and Urine.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 104–106. **1163**

T. has investigated the factors which give rise to false negative tests with standard Meyer and benzidine reagents in examining milk and urine for red blood cells. Among contributing factors to such results is lessened fragality of the red cells, increased alkalinity of the specimen producing alkaline haematin which does not react, and entanglement of the r.b.c. in precipitating phosphates.

It is suggested that such false negative results may be avoided by pre-acidification and heating, storage at room temperature for 12 hours, or by centrifuging the sample and making up the deposit to its original volume in distilled water to cause haemolysis of the r.b.c.
—D. L. HUGHES.

RAY, S. C. (1942). **A Semi-Micro Method for Estimating Allantoin and its Excretion in the Urine of Farm Animals.**—*Indian J. vet. Sci.* **12.** 234–240. **1164**

A rapid semi-micro method is described for estimating allantoin in the urine of farm animals. The

allantoin content in the urine of cows, goats, and sheep has been estimated by the proposed method and compared with existing figures.—B. N. Majumdar.

Turkel, H., & Bethell, F. H. (1943). **Biopsy of Bone Marrow Performed by a New and Simple Instrument.** —*J. Lab. clin. Med.* **28.** 1246–1251. **1165**

The authors have devised a simple instrument for obtaining a specimen of sternal marrow from human beings without the necessity of making a skin incision. The instrument consists of two needles with stylets, an outer guiding needle being used to penetrate the skin and subcutaneous tissue and an inner trephine needle to penetrate the sternum and remove a sample of marrow. Sections of specimens obtained in this way show the cellular relationships and the method is useful in conjunction with examination of samples obtained by aspiration. The latter procedure has been very extensively employed during recent years.—E. G. White.

Henderson, W. M. (1943). **Intracutaneous Injection of Cattle.**—*Nature, Lond.* **152.** 629–630. **1166**

A special syringe was constructed for injecting large quantities of fluid (up to 10 ml.) intracutaneously into cattle. The syringe comprises a metal piston which fits the barrel very closely. To prevent seizing, the sides of the piston are formed by an "oilite" bearing bush which is normally self-lubricating. The apparatus is emptied and filled by a knurled wheel on the end of the piston rod. Pressures up to 50 lb. per sq. in. are obtainable without any significant leakage of inoculum past the piston.—R. E. Glover.

Carle, B. N., & Dewhirst, W. H., Jr. (1942). **A Method for Bleeding Swine.**—*J. Amer. vet. med. Ass.* **101.** 495–496. **1167**

The technique of bleeding pigs from the anterior vena cava (formed by the junction of the jugular, brachial, and internal thoracic veins) by means of a glass syringe with a 20-gauge 1½–2½ in. needle is described as being far superior to bleeding from the tail or ear, since by the method described relatively large volumes of sterile, unhaemolysed blood can be obtained easily and without elaborate restraint. Provided that a small-gauge needle was used, repeated bleeding by this method proved harmless.—R. O. Muir.

van den Ende, M. (1943). **An Apparatus for the Safe Inoculation of Animals with Dangerous Pathogens.** —*J. Hyg., Camb.* **43.** 189–195. [With an appendix by Hubbard, A. J. G.] **1168**

Specially designed experiments, together with an infection of laboratory workers with typhus fever [see *V. B.* **14.** 122, abst. 792.], show that during the intranasal inoculation of mice a significant dissemination of infective droplets occurs. The number of droplets is greater if there is bubbling at the nostrils during inoculation.

A specially designed steel and glass box was constructed to prevent infection of workers when inoculating mice. Powerful through-draft ventilation was provided by the flame from an ordinary gas boiling ring and a chimney which were arranged so that all air drawn up the chimney was effectively heated. The apparatus was shown to prevent the distribution of droplets into the air of the laboratory during inoculation of mice and has given satisfactory results under routine conditions. Exact details of the design are given.—John Francis.

Warren, D. C. (1942). **Distinguishing Sex of Chicks at Hatching.**—*Bull. Kans. agric. Exp. Sta.* No. 307. pp. 29. **1169**

This is a bulletin giving a fairly comprehensive review of the various methods of sexing chicks at hatching. The question of popularity and vigour of crossbreds is discussed and a table is given comparing the performance and mortality of various crosses and of the corresponding pure breeds.

Sex identification of pure breeds is discussed under the headings of:– Barred Plymouth Rocks, Rhode Island Reds, autosexing breeds, feathering strains, and the Japanese or vent method. Identification of crossbreeds (sex-link method) is dealt with, particular emphasis being given to the Gold-Silver Cross, Barred-non-Barred cross and Feather Growth cross.

The bulletin is well illustrated with 12 good photographs clearly explaining the various points under discussion in the text.—J. D. Blaxland.

Jeffrey, F. P., & Thompson, W. C. (1943). **Sight-Sexing of Newly Hatched Chicks of Standard Breeds.** —*Bull. N. J. agric. Exp. Sta.* No. 705. pp. 8. **1170**

Sight-sexing, based on external character, such as down colour, colour markings in the down, and shank colour, observable at hatching, is discussed with reference to Barred Plymouth Rocks and Rhode Island Reds. This method was found to be 95% accurate in the former breed, but ineffective in the latter.

The method of producing the Leg-bar breed, which is autosexing, is described. Egg production in this particular strain was found to be poor and eggs were mostly tinted and of small size.—J. D. Blaxland.

Chapman, E. M., & Goldstein, A. (1943). **The Physics of Sound with Particular Relation to Examination of the Patient.**—*J. Lab. clin. Med.* **28.** 1535–1541. **1171**

A description of the physical properties of sound waves and an attempt to correlate them with clinical findings.

Tympany is a musical note of pure pitch produced when a mass of air vibrates in sympathy with the percussion note. Whenever it is heard, it is an indication of the presence of air. Resonance is a note of deeper pitch, richer in overtones which is heard over normal lung. Dullness is higher pitched and of shorter duration than resonance; it indicates that dense tissue underlies the pleximeter; it is the normal note over the heart and when heard over the lung indicates consolidation, etc. Flatness is the epitome of dullness; the pitch is very high and the note entirely non-musical; it is heard normally over the thigh and over fluid or very thick tissue.

See also abst. **950** (diagnosis of anthrax).

MISCELLANEOUS

Lignières, R. (1943). A propósito del decreto del Superior Gobierno de la Nación sobre control de productos veterinarios. [**Concerning the Decree Relating to the Control of Biological Products in the Argentine**].—*Rev. zootéc.* **30.** No. 251. 10–15. 1 appendix. **1172**

L. emphasizes that control of veterinary products is essential. The formulae of effective remedies should be protected and, since the introduction of control must be gradual, the first products to be controlled should be biological ones.—Miller Watson.

Lesmes, E. (1942). La medicina veterinaria en Colombia. [**Veterinary Medicine in Colombia**].— *Rev. Med. vet., Bogotá.* **11.** 508–511. **1173**

A veterinary school was founded in Bogotá in 1885,

but for various reasons was closed in 1889. The present faculty was founded in 1921.

L. describes the difficulties encountered by the veterinary profession in Colombia in its early days because of lack of support by either the Government or the people. There are private practitioners in the country, but they are not numerous. Much clinical work is done by the Faculty of Veterinary Medicine, in addition to the carrying out of wide-scale prophylactic measures.—MILLER WATSON.

—. (1942). Escola superior de veterinária do estado de Minas Gerais. [**The Veterinary College at Minas Geraes, Brazil**].—*Bol. Soc. brasil. Med. vet.* **11.** 189–190. **1174**

This is a description of a new, well equipped veterinary college founded in 1942 at Bello Horizonte, capital of the state of Minas Geraes, Brazil. There are illustrations of the school building and of a portion of the library, a laboratory, and other items, one of them being a section for the maintenance of live snakes (serpentarium) presumably for the purpose of preparing antivenins.—MILLER WATSON.

RAE, R. (1943). **The Improvement of Livestock.**—*Vet. Rec.* **55.** 429–432. Discussion pp. 432–440. **1175**

Details are given of the history of the cattle herd of the National Institute for Research in Dairying, Reading.

The official scheme of milk recording must form the basis of any policy for the breeding of better dairy stock, since selection can only be made on milk and butterfat records. The scheme was introduced in 1914, but progress was slow and in 1937 there were still only 5,000 recorded herds in England and Wales. To improve the position, a National Milk Records Scheme was inaugurated in 1943. The scheme is in two sections, senior and junior. The senior section is identical to the old official scheme.

Dairy herd survey and register of bull-breeding herd schemes also play important roles in livestock improvement. These schemes are operated by the County War Agricultural Committees. Shortage of good bulls has retarded progress, and supplies of such animals from the best herds are urgently required.

Artificial insemination is the quickest method of improving livestock and is likely to be increasingly used.

Regarding pigs, a national recording scheme to set up standards of production, to eliminate scrub boars, and to restrict the number of breeds is necessary.

In the discussion, E. M. CURLEY, U.S.A., dealt with the role of the veterinary profession in the control and eradication of animal disease and with the duties of the Veterinary Corps of the U.S. Army.

Tj. BAKKER stressed the necessity of balancing environmental conditions and hereditary constitution. He considered that there was a need to breed primarily for constitution before other factors were considered. At the present time, the basic necessity for livestock improvement is the keeping of much more comprehensive records than formerly.

S. L. HIGNETT dealt especially with the Licensing of Bulls Act which he felt had not given satisfactory results in Britain. The licensing of cross-bred bulls was greatly to be deplored. In horses, however, the Licensing of Stallions Act had operated satisfactorily. In sheep, a major problem was to maintain hardiness and, at the same time, produce an animal to meet market requirements. Rapid advances in pig breeding were likely to follow centralized grading and slaughtering. As to poultry, the war had presented an excellent opportunity to restock the country with disease-resistant birds.

H. W. STEELE-BODGER considered that the policy outlined in the White Paper on milk was a retrograde step and was not conducive to the improvement of livestock.

W. C. MILLER stressed the necessity of improved husbandry for young stock and raised the question of how near Britain was to saturation point in livestock population. RAE thought that from the nutritional viewpoint, the number of livestock could be increased with advantage to above the pre-war level.

Sir A. OLVER dealt with animal husbandry and livestock improvement in India. He emphasized the great part which feeding and management played in the improvement of cattle.

N. S. BARRON deplored the popularity of the dual purpose cow. He advocated single purpose animals and thought that the 800-gallon cow was a good objective.

—D. D. OGILVIE.

BOTT, A. E. (1943). **Veterinary Preparedness in Illinois.**—*N. Amer. Vet.* **24.** 209–212. **1176**

There is now no veterinary college in Illinois and the number of veterinarians is inadequate. B., who was chairman of the Illinois Veterinary Procurement and Assignment Service Committee, reports on the successful work and negotiations in which this committee was engaged with the State Selective Service Boards in order to conserve veterinary manpower by requesting the deferment of active veterinarians from induction in the forces except in a professional capacity. The important role of the veterinarian in a nation at war is emphasized as being the safeguard of its vital weapon, the food supply.—A. C. JONAS.

WARE, F. (1942). **The Cattle of India and their Development.**—*Indian J. vet. Sci.* **12.** 62–72. **1177**

The actual, as well as the potential, value of India's cattle industry, although still undeveloped, is very great. W. enumerates the estimated annual values of milk and milk products, of hides and skins, etc. Fodder resources, which are the backbone of the cattle industry, are discussed and compared with those of other countries.

According to physical characters, Indian breeds of cattle can be divided into five well-marked groups. Some breeds are similar to those in Africa and their probable origin is discussed.

Under measures adopted for the improvement of cattle, W. describes the activities of the Imperial Veterinary Research Institute (Mukteswar), the Central Dairy Research Institute (Bangalore), the Imperial Agricultural Research Institute (New Delhi), the Imperial Council of Agricultural Research, etc.

—M. K. SREENIVASAN.

HAMMOND, J., EDWARDS, J., & WALTON, A. (1942). **Animal Breeding in Relation to Environmental Conditions.**—*J. R. agric. Soc.* **102.** 156–170. **1178**

A semi-"popular" review article, in which concrete examples of the interaction between the animal and its environment are cited in order to show that selection at the highest levels for increased productivity can proceed only when an environment optimal for the production of the character it is desired to develop has been first established. Most of the article deals with the effect of different nutritional planes on body size and conformation in the meat-producing animals. A brief account is also given of the importance of the nutritional environment under which breeding and selection in dairy cattle are carried out. The relation of constitution to environmental conditions is discussed, mainly with reference to the determination of European species in the Tropics. Thirty-six of the more important references in the literature relating to the aspects dealt with are cited.—N. J. SCORGIE.

SIMMONS, R. J. (1943). **A Colonial Veterinary Department in Peace and War.**—*Vet. J.* **99.** 107–110. **1179**

The work of the veterinary department in Uganda is reviewed briefly to show how the character of its activities has changed.

The days have apparently passed when the major work of the department was the combating of widespread epizootics. The more important task is now the fostering of animal industries, with the object of producing and marketing animals and animal products of improved quality. The post-depression period of development in Uganda in other industries and the demands for increased output since the outbreak of the present war have greatly increased the present and the possible future demands for all animal products. It has become more than ever important to improve the quality of animal produce by attention to the methods of preparation for marketing of such items as hides and skins, butter, ghee, meat, and all other products of value.

There has been a change in the attitude of Government to the great increases in the numbers of livestock which took place as a result of the control of epizootic diseases. It is realised that with proper management, livestock are an asset to the country in maintaining the nutrition of the native African, not only in providing milk and milk products for food but also in providing humus for the soil and bullocks for ploughing and for general farm work.

Details are given of the means adopted by the veterinary authorities to develop animal industries in the pre-war years. These were so extensive that the industries were able to increase rapidly to meet the output required during the war.

Other activities related to the main object were the eradication of tsetse-fly belts, the provision of water supplies in arid areas, and general propaganda on the improvement of animal husbandry.

Meanwhile, research and production work is carried on at the veterinary laboratory, the veterinary school continues its five-year course for African students, and the experimental stock farm carries out research on the feeding of locally grown concentrates and the use of local and imported plants as fodder crops.

S. considers that the scope of activities of such a department shows the importance of selecting candidates for service in the colonies who have not only capabilities for research, but also have experience of farming and of farm livestock in health and sickness.—J. A. G.

THOMPSON, J. W. (1942). **A History of Livestock Raising in the United States, 1607-1860.**—*Agric. Hist. Ser. U.S. Dep. Agric.* No. 5. pp. viii+182. **1180**

The subject matter of this publication is largely drawn from contemporary agricultural and other writings of the period under review, from which numerous quotations are made in the text. The period dealt with covers the development of the American livestock industry from the early colonial days to the establishment of the extensive, ranching type of livestock raising, which held sway for a further 20 years to about 1880.

> "The history of animal husbandry, as described in this report, is closely integrated with the general pattern of American development to 1860. In the acquisition and settlement of each frontier, livestock played a unique and vital role, providing the pioneers with transportation, food, draft power, and economic enterprises."

It is perhaps surprising that there is little reference to animal disease and its effect on the course of livestock development and expansion.—N. J. SCORGIE.

I. —. (1943). **Final Act of the United Nations Conference on Food and Agriculture, Hot Springs, Virginia, United States of America, 18th May–3rd June, 1943.** pp. 40. Miscellaneous No. 3 (1943). Cmd. 6451. London: H.M. Stat. Off. [8vo] [9d.] **1181**

II. —. (1943). **United Nations Conference on Food and Agriculture, Hot Springs, Virginia, United States of America, 18th May–3rd June, 1943. Section Reports of the Conference. (In continuation of Miscellaneous No. 3 (1943), Cmd. 6451).** pp. 31. Miscellaneous No. 4 (1943). Cmd. 6461. London: H.M. Stat. Off. [8vo] [6d.] **1182**

I. The object of the conference was to consider the goal of freedom from want in relation to food and agriculture throughout the world. Both short and long-term policies were agreed upon. In order to secure the fulfilment of the recommendations of the conference interim and permanent commissions were set up.

Recommendations are made concerning the relationship between nutrition and disease, the prevalence of specific deficiency diseases, the establishment of national nutritional organizations, the international exchange of information, dietary standards, co-operation of existing national nutritional organizations, standards of minimum consumption of non-food agricultural and marine products, agricultural credit, co-operative movements, land tenure and farm labour, education and research, conservation of land and water resources, land settlement, occupational adjustments in rural populations, international security, international commodity arrangements, national and international food distribution, and general features of marketing.

II. The section reports are concerned in detail with consumption levels and requirements, methods of expanding production and adapting it to consumption needs, and the improvement of distribution.

It was anticipated that after the war there will be a short-term period of acute shortage. During that time the dominant problem will be the most rapid means of alleviating famine. The solution advocated entails increasing the acreage under crops for direct human consumption and holding back the rebuilding of depleted livestock herds. Only when conditions have become more settled will the rebuilding of herds be justified. Ultimately, however, a greater area of the world than previously will be set aside for livestock.

Measures to improve productivity are outlined at length and include efficient disease control and the proper use of veterinary drugs.—D. D. OGILVIE.

KISLER, A. P. (1942). Proizvodstvo bakteriĭnykh preparatov za 25 let. **[Twenty-Five Years' Production of Bacterial Preparations].**—*Zh. Mikrobiol., Moscow.* No. 11/12. pp. 86–90. **1183**

Considerable advances have been made in the U.S.S.R. during the past 25 years, particularly since 1933, in the preparation of various bacterial preparations. The products discussed are the common antibacterial ones prepared for use on human beings.

—A. MOLDAWSKY.

SMITH, J. M. (1943). **The Veterinary Surgeon in the Development of the Colonies.**—*Vet. Rec.* **55.** 415–418. Discussion pp. 418–424. **1184**

The role of the veterinary surgeon in the development of the colonies is discussed under control of diseases of animals, research, livestock improvement, export trade, dairying, veterinary education, protection of animals, status of colonial veterinary officers, and future veterinary work in the colonies.

In East and West Africa, most of the time of the veterinary field staffs is devoted to the control of rinderpest, bovine contagious pleuro-pneumonia, trypanosomiasis, and tick-borne diseases. The laboratory staffs are chiefly engaged in producing sera and vaccines for this work.

Research in the colonies is directed mainly to hitherto unobserved diseases in given territories. Efforts are now being made to widen research programmes to embrace the problems of groups of territories and thus to prevent overlapping and other difficulties.

Livestock improvement is directed towards the production of a uniform type of animal which can be used as a foundation for dairy and meat industries. The use of artificial insemination in this connexion is advocated.

The chief export trade of certain of the colonies in animal products is in hides and skins. Recently this trade has been encouraged by the veterinary officers in order to meet the greatly increased demand. Because of difficulties in the export of live animals, factories for meat canning and the preparation of by-products have been erected in certain of the colonies and there is export of canned and frozen meat.

Dairy farming is generally unimportant in the colonies, but in the majority of the larger centres of population a fresh milk supply is available and butter and cheese are manufactured.

For many years, elementary veterinary training has been given in certain territories to selected natives. Recently, schemes have been approved for the training of natives as assistant veterinary officers and as veterinary assistants.

Future veterinary work in the colonies will be concerned to a considerable extent with the establishment of cattle breeding and dairy farming and the associated meat and milk industries. Methods of husbandry will have to be improved.

It is advocated that steps should be taken immediately to produce a sufficient number of specially trained veterinary surgeons to undertake the great amount of work which will arise from the anticipated development of the colonial empire.

In the discussion, W. KEARNEY dealt chiefly with the position of veterinary services in Kenya and Nigeria and the steady increase in prosperity which had resulted from their efforts.

J. SMITH reviewed the part played by the colonies and their veterinary services in the war effort. Recent events have shown that immediate increase of the colonial veterinary service is envisaged. The plans for such expansion have been prepared and the necessary funds made available. Only the manpower shortage is likely to hinder fulfilment of the scheme.

G. N. HALL dealt with the development of veterinary services in Sierra Leone and the Gambia, and W. H. CHASE with Bechuanaland Protectorate. M. H. KYAW referred to the work of the veterinary services in Burma. He suggested the setting-up of an Empire School of Tropical Veterinary Medicine somewhere in the tropics. In the meantime, teaching in tropical veterinary medicine should be arranged to take place at the institutes at Mukteswar and Onderstepoort rather than in Britain.—D. D. OGILVIE.

REPORTS

GREAT BRITAIN. (1943). **Colonial Development and Welfare Act 1940. Report on the Operation of the Act to 31st October, 1942.** pp. 14. London: H.M. Stat. Off. [8vo]. [3d.] **1185**

Under this Act, the Secretary of State is authorized to make schemes for any purpose likely to promote the development of the resources of any colony or the welfare of its people. Expenditure authorized under the Act for schemes for promoting research or inquiry is limited to £500,000 in any financial year, without limitation as to duration. For other schemes, a limit of £5,000,000 in any financial year may not be extended beyond the 31st March 1951. It is evident, however, that Government intends in due course to extend the provision of financial aid beyond the period at present fixed.

Owing to war-time restrictions, it has not been possible for Government to carry out all that was intended. Proposals helpful to the war effort have been given approval, but other schemes, although important, must be carried out with local resources in men and material without detriment to the war effort or expenditure outside the sterling area. These schemes must also be of such urgency as to justify the expenditure of United Kingdom funds in the present circumstances.

A total expenditure of £2,089,557 had been authorized up to 31st October, 1942. Veterinary schemes amounted to £170,814 including the following:– Tanganyika, for rinderpest control, £93,300; Nigeria, for a veterinary training school, £50,700; Antigua, for improved veterinary services and development of animal husbandry, £8,350; Virgin Islands, for tick eradication, £5,163; British Guiana, for a livestock officer, £5,700.—J. A. GRIFFITHS.

INDIA, PUNJAB. (1940). **Annual Report of the Civil Veterinary Department, Punjab, for the year 1938-39** [WALKER, U. W. F.] pp. iii+43+xxxiv. Lahore: Supt. Govt. Printing. [8vo] [Re. 0–4–0 or 5d.] **1186**

There were 38 gazetted and 432 non-gazetted officers. The total expenditure of the department amounted to Rs. 26,79,820.

The number of deaths resulting from major infectious diseases amongst cattle during the year were as follows:– HAEMORRHAGIC SEPTICAEMIA, 10,938; BLACKLEG, 500; ANTHRAX, nil; RINDERPEST, 15,311; FOOT AND MOUTH DISEASE, 961. Preventive inoculations carried out included the following:–

RINDERPEST — goat-virus vaccination of cattle 965,275, serum alone inoculation of cattle 52,292, serum inoculation of goats 3,410; HAEMORRHAGIC SEPTICAEMIA—vaccination 440,327, serum inoculation 46,590; BLACKLEG—inoculation 2,948, vaccination 21,398.

314 veterinary dispensaries were operating during the year. In these, and by veterinary surgeons on tour, 636,255 castrations were performed. Treatment carried out by veterinary surgeons on tour numbered 524,107; those at veterinary dispensaries, including the distribution of medicines, numbered 20,275,538.

6,355 stud bulls, 601 stud buffalo bulls, 86 horse and 91 donkey stallions were maintained by local bodies for public use. 280 cattle fairs were held during the year.

The outstanding feature of the year was the severe famine conditions prevailing in the Hissar, Rohtak, and Gurgaon districts, owing to three successive monsoon failures. Cattle died in large numbers, while thousands either migrated or were sold out of the province. To save the cattle of the destitute and to preserve the famous Hariana breed, the Punjab Government purchased and maintained over 12,000 head of good cattle with a view to re-selling them to their owners later at the original cost price. Two cattle camps were opened. Privately owned bulls were subsidised and fodder was purchased and distributed for issue to selected bullocks, cows, and camels.

The work of the Hissar Government Cattle Farm was seriously handicapped by the depletion of its fodder reserves and it is anticipated that its herd will take several years to recover from the disaster. The grantee

cattle farms continued to flourish and lessees exhibited a good number of cattle at the All-India Cattle Show.

Eighty-seven candidates were admitted to the Punjab Veterinary College at the beginning of the year, making a total of 202 students on the rolls. Eleven students qualified during the year.

Special items of research included investigation upon the following :– (i) The incidence of tuberculosis in dairy herds ; (ii) enzootic haematuria ; (iii) helminth infections and deficiency diseases ; (iv) goat, sheep, and fowl diseases ; (v) plant poisoning ; (vi) sterility and contagious abortion ; (vii) osteomalacia in cattle.

—L. H. SHIRLAW.

U.S.A. LOS ANGELES. (1943). **County Live Stock Department. Review Covering Recent Field and Laboratory Work in Animal Disease Control 1942-1943.** [HURT, L. M.] pp. 55. Los Angeles, Calif. [4to] [Mimeographed]. **1187**

Tuberculin tests of all dairy cattle in Los Angeles County in 1942–43 revealed 47 reactors in 102,548 animals (0·045%). Tests on 19,840 dairy cattle imported into the county disclosed 198 reactors (0·99%).

According to the rate of importation, the average period of usefulness of cows is only 2 years 3 months. It is suggested that up to 50% of cows at present slaughtered could be saved under veterinary supervision for further dairy use.

Experience in calfhood vaccination against BRUCELLOSIS during the year showed that in most instances a firm swelling developed at the site of inoculation and persisted for several weeks. In one batch of calves there were severe systemic reactions for 72 hours.

Sporadic cases of lobar PNEUMONIA were frequently observed especially in imported cattle. These responded favourably to sulphonamides.

Control of *Boophilus annulatus* for the prevention of *Babesia bigemina* infection, by spraying with an arsenical mixture instead of by dipping was very successful. Treatment with sodium cacodylate for the prophylaxis and treatment of ANAPLASMOSIS was useless.

One case of RABIES in a cow is described.

In horses, cases of EQUINE ENCEPHALOMYELITIS, RABIES, INFECTIOUS ANAEMIA, and castor bean POISONING are recorded.

In pigs, outbreaks of VESICULAR EXANTHEMA occurred in nine herds. Other diseases recorded included SWINE FEVER, SCABIES, PIGLET ANAEMIA, and NECROTIC ENTERITIS. The use of sulphaguanidine in doses of 1 gr. per 10 lb. body weight in necrotic enteritis is advocated.

The most frequently observed poultry diseases were PNEUMOENCEPHALITIS, BACILLARY WHITE DIARRHOEA, FOWL CORYZA, COCCIDIOSIS, and LYMPHOMATOSIS. In turkeys, the most common conditions were PULLORUM DISEASE and PARATYPHOID.

A review of current research in animal diseases is appended.—D. D. OGILVIE.

See also abst. **1040** (State Entomologist, Montana).

BOOK REVIEWS

DUERST, J. U. [Dr.h.c., o. Professor der Hygiene und Zootechnik an der vet. med. Fakultät der Universität Bern, Dozent der Haustierphysiologie und Direktor des veterinärhygienischen und zootechnischen Institutes]. (1941). Die Ursachen der Entstehung des Kropfes (Struma) und seiner Formen bei Mensch und Tier mit Ausblicken auf rationelle Prophylaxe und Heilung. [**Causes of Goitre in Man and Animals, with Notes on Rational Prophylaxis and Treatment**]. pp. 539. 82 figs. Berne : Hans Huber. [8vo] [Sw. Fr. 24]. **1188**

This monograph is a valuable contribution to the field of comparative pathology by a veterinarian who for more than 30 years has made a study of the thyroid gland in wild and domestic animals. With the encouragement of his medical colleagues at the University of Berne he has more recently extended his studies to human endemic goitre in Switzerland.

The first main section of 148 pages deals with the structure of the thyroid and thymus glands—grouped together by the author as the " thyreo-thymic system " —in vertebrates, with a special chapter devoted to the domestic animals. It is here that the author's most important contribution to the problem of goitre is first put forward, *viz*, that oxygen deficiency and carbon dioxide excess in the air are important as a cause of thyroid hyperplasia. D. claims to have shown a correlation between thyroid weight in stall-kept milch cows and the oxygen content of the air in the byre, thyroid hyperplasia being proportional to the degree of oxygen deficiency. Carbon dioxide excess is also considered to have the same effect and its importance is stressed in animals kept under conditions of inadequate ventilation.

Part II deals with the effects on the thyroid of a great variety of factors, including atmospheric temperature, iodine and various minerals, age, sex, puberty and gestation, the autonomic nervous system, etc.

Part III is devoted to environmental factors in human endemic goitre, including the atmosphere in goitrous and non-goitrous areas, climate, water supply, and the character of the soil.

The final section is mainly a discussion of how man's activities may affect the incidence of goitre. Diet is considered at length, especially the amounts of K and Ca in the food, which are considered to be of importance. Excess of Ca in the diet, as in the cattle breeding regions of the Alps where the inhabitants consume large quantities of milk and cheese, is said to cause colloid goitre. Meat and animal fats, rich in K, have the opposite effect and induce thyroid hypoplasia. The author believes that, as in cattle, the presence of excessive amounts of CO_2 in the air, as occurs where dwellings are situated at the edge of large areas of woodland, is a cause of endemic goitre. Illustrations are provided which show how this concentration of CO_2 may arise according to the relative position of houses and woodland and the author even goes as far as to suggest means to overcome this effect. The living conditions during the winter months result in very striking accumulation of CO_2 inside dwellings. For example, it is stated that the air space is often only 3–4 cu. m. per person and ventilation literally non-existent.

This book is well produced on excellent paper, and is provided with 82 illustrations including some photomicrographs, and several hundred references. Unfortunately, there is no index. All who are interested in the problem of goitre in man and animals will wish to refer to this work and consider critically the views put forward. Veterinarians, in particular, will be grateful for being provided with much useful information as well as ready access to a considerable number of papers by other authors.—E. G. WHITE.

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